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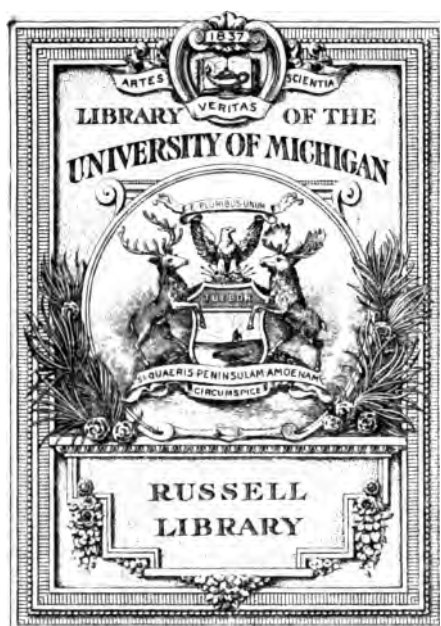
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THE APPALACHIAN MOUNTAIN CLUB

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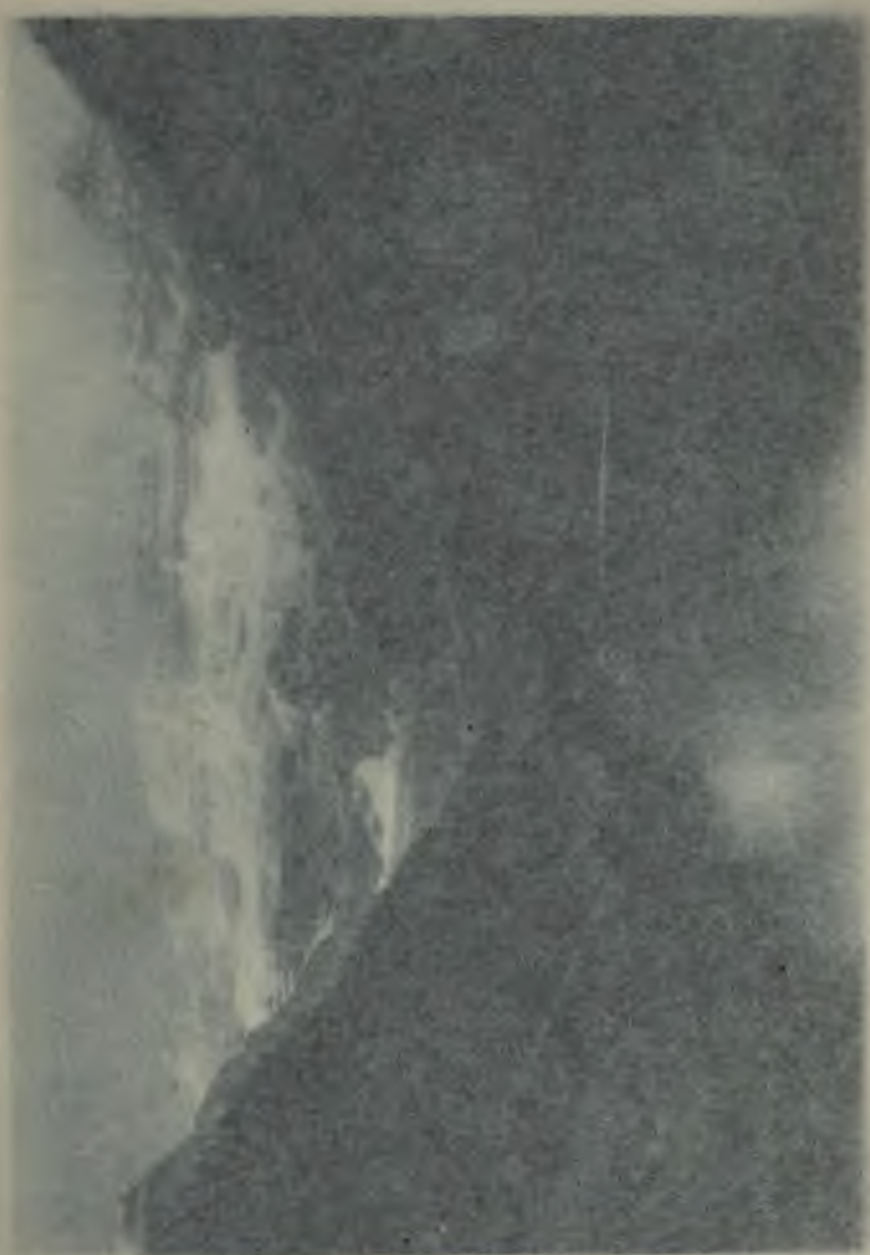


Photographed

Lake Louise, Can.

LAKE LOUISE AND MOUNT VICTORIA.

From a Photograph by William Notman & Son.



APPALACHIA.

VOL. IX.

BOSTON, MAY, 1899.

No. 1.

The First Ascent of Mount Victoria.

BY CHARLES E. FAY.

WHO will define the impressive charm of the great white peak that closes the vista beyond Lake Louise to him who sits on the piazza of the Chalet, yielding himself to the spell of a landscape combining, perhaps, more of grandeur and beauty than can be found elsewhere upon our continent? The eye has traversed the rippling pale blue waters of the lake, the belt of forest at its upper end, the gray upland slope of the glacier floor of the deep, gorge-like valley. It has paused for a moment checked by the flank of Lefroy, descending in bold leaps and thrusting out into the glacier a prow of rock nearly a thousand feet sheer. But now, in a yet bolder flight, the vision soars a little way beyond, to where the vast wall of Mount Victoria stays and satisfies its most ambitious craving. First, the dark face of a still more forbidding cliff, finishing above in a blue-white margin, a conterminous face of ice three hundred feet in thickness,—for thus ends the snowy drapery of the rapidly retreating wall. Broken higher up at intervals by bands of rock, this upper portion easily assumes the appearance of a series of terraces of ice, gradually retreating until they meet the blue of the low-arched sky. In this meeting there is no conflict. The peak does not storm heaven, does not pierce it. So gradually does the massive mountain swell heavenward that it rather gives the impression of a vast barrier set at the confines of the world than of a soaring peak. So subtle is this impression that even to a practised professional eye Mount Victoria could seem “a wall of uniform height two miles in

length." That this is illusory will be obvious to any who care to follow for a while this narrative of how that sky-line was first traversed by human feet.

I do not forget my first sight of Victoria in a mere passing visit at Lake Louise in 1894. Rowing on the lake at sunset, with eyes fascinated by the glory of the scene, with imagination almost appalled by the crevasses of its hanging glaciers, more clearly marked in the shadow and colder by contrast with the sunset hues, I said to my companion: "He who attempts that mountain stakes his life for the prize." Let it not argue for any readiness to part with that blessing if I add that, immediately on reaching shore, I listened with a pang of regret to an invitation from Mr. Allen — just in the first flush of his success on Mount Temple — to stop over for a few days for an assault on this very mountain. An inexorable itinerary compelled a reluctant declination. Little did I suppose that it was still reserved for me to join in the first successful attempt to reach its summit, and under circumstances quite banishing the idea of risk.

The two following seasons had found me again at Lake Louise, as indeed has every season since that first visit. I confess myself infatuated with its beauty and charm, and, like most lovers, I have no desire to break away from my fascinator. On neither of these two visits had an attack on Victoria been seriously meditated. But once again on the ground, with a strong party, and having finally conquered Lefroy, to which for now three years our efforts had been chiefly directed, the conquest of Victoria became the natural corollary to that victory, and two days later, on August 3, 1897, we undertook this more delightful enterprise.

The maxim that there can be "too much of a good thing" applies even to good company, at least in the ascent of a somewhat difficult mountain. While there is not one of the nine who successfully reached the summit of Lefroy whom I can bear to think of as absent from our number, nevertheless my better judgment tells me that there were at least three times too many to assure the desirable factor of safety on a mountain where the rotten condition of the rock at its occasional outcrops renders it almost impossible not to send dangerous fragments

rolling from under rope or yielding footholds. For Victoria we had four, the permissible maximum: Dr. J. Norman Collie, of the Alpine Club, Professor Arthur Michael, and the present writer, with Peter Sarbach, of St. Niklaus, a most admirable Swiss guide. On this day, however, Dr. Collie took the lead, Peter gracefully yielding his usual place to this distinguished expert. While our party tackled Mount Victoria, another group of four made the trip over Mitre Pass. Our ninth stayed at the Chalet to nurse a lame knee, gotten from the impact of a small stone by which he was struck on the descent of Lefroy.

No parties ever got away for their day's work in better trim than did ours for Lefroy and Victoria. We had thought ourselves in great luck in our training climbs at Glacier House, when for our starlight departures Miss Mollison had given us the freedom of the hotel kitchen and dining-room, with warm soup awaiting us in the "heaters" and varied viands under tidy napkins on our special table; but, in his zeal for our comfort, Mr. Howard, of the Chalet, furnished us on both these days a regular hot breakfast, juicy beefsteak, hot rolls and coffee, at three A.M., and on this particular occasion had sat up all night to make sure of a perfect start for us. The memory of that breakfast will ever be held in grateful remembrance.

It was 3.45 when we stole out into the darkness and down to the float at the shore of the lake, and a few moments later, with our belongings stowed in the bow of the Agnes, we were again making the strange transit between two starry vaults. The reflected constellations vied in brilliancy with those on high, while those nearest the horizon on left and right gradually became eclipsed by the mountain walls, as under the slow, but sturdy strokes of Michael and Sarbach, we advanced deeper and deeper into the great ravine, whose head-wall, vaguely divined rather than visible, was the goal of our quest.

Landing on the right of the inflow, we made rapid time with our lantern across the half-drowned flat, despite its balking strands of torrent, and also along the varied but now familiar reaches of rubble, boulders, and moraine lying between the lake and the glacier.

I cannot forbear to mention two supreme quarter-hours in this silent advance. One, when the sky began to grow paler

about the brilliant morning star, and this pallor, caught by the lofty snows on Lefroy and Victoria, brought out their vast hovering forms like weird and portentous spectres. There was something uncanny in the spectacle, something to raise the question whether our attempt was not sacrilege, and whether it was not the matching of impotent mortal powers against forces supernatural and remorseless. The other, so utterly contrasted, was when the first rays of the rising sun, concealed from us by the mass of Mount Fairview,¹ flushed those snows with tints of rose and converted the omen into one of alluring promise.

The annoying experience of two days before, when our scattered party had made all sorts of time over the crevassed portion of the glacier just under the shoulder of Lefroy, showed the wisdom of always keeping on the other side of the glacier, and off of it so long as possible, following beside the stream that flows parallel with the ice just under the base of the valley wall. By thus doing, we were able (before we took to the ice at a point opposite to the Couloir) to make up the half-hour by which our start was later than on that occasion.

I was struck by the change that had taken place here since my first visit to the spot in 1895. So rapidly has the melting progressed that the edge of the glacier has receded many yards, and, badly dilapidated, exhibits a great number of muddy marginal crevasses. The surface of the ice, too, presents a marked contrast to what we found it then. The "dry" portion at that time ceased just below the Couloir; above that point the crevasses were for the most part bridged; now the bare surface of ice extended several hundred yards higher towards the cliffs of Victoria, opening up a maze of crevasses that then were for the greater part unsuspected under the thick layer of old snow.

It is an ascent of some two thousand feet to the top of Abbot Pass, through the canyon-like gorge lying between Lefroy and the southern end of Mount Victoria. The familiar way this time proved unusually toilsome. The night had evidently been warmer than usual, and now a mild breeze was drifting down the canyon, softening the snow so that we constantly sank half

¹ The new name adopted by the Topographical Survey for "Goat Mountain," by which it has been characterized in former issues of APPALACHIA.

way to our knees. But taking an easy gait and with infrequent stops we reached the pass at 7.45.

Till now all had been familiar; from here onward our every step was to be surrounded with that mystery and uncertainty that is the never lessening charm of every virgin ascent.

The morning was exquisite, radiant with sunlight, and in this more exposed position the almost tepid breeze of the canyon became the cool, brisk promise of a gale. To our gratification it later subsided, — so that I may still report that I have never experienced a heavy wind during any ascent in the Canadian Alps. The view to the south was supremely grand through the pure sunlit air; but our eyes turned from the soaring lines of Goodsir, Biddle, and Hungabee, to the bold wall never yet attempted which rises sheer on the right of the pass. It was not the first time that its broken surface had been questioned for a possible way of ascent. I recalled Abbot's challenge as we sat lunching here the year before, to give that crag a try as we should return in the afternoon from the summit of Lefroy, whose conquest at that moment seemed assured for an early hour. How enthusiastic he was in his conviction that the beginning at least of the way from the pass to the summit of Victoria lay within our powers! Now it was to be tested, and in company with the very guide under whose instruction he had learned to recognize so clearly what lay within and what beyond the limits of the possible. We moved towards the crag to a point somewhat to the right of the divide, and found a favorable place to attack. Twenty minutes later we had surmounted this initial difficulty, — only difficult, as it proved, on account of the extreme rottenness of the rocks, and the necessity for caution in all our movements. A pause for our second breakfast by a trickle of icy water celebrated this first success.

I have said that the sky-line of Victoria as seen from the lower end of Lake Louise gives the impression of a very gradually ascending snowy ridge. A more careful study, however, brings out two features which break this reposeful monotony: the first, a sag not far to the right of where the profile of our mountain vanishes behind the icy helmet of Lefroy; the other, an inconspicuous stretch of rock wall about midway between this depression and the main summit, where for a space its

dusky hue interrupts the white at the meeting of mountain and sky. In reality this sag separates from the principal mass of Victoria a portion almost individual enough to have a name of its own.¹ It was upon the southern end of this portion that we were pausing for our luncheon, still upon rock, yet with right at hand the gleaming softened snow, for which we were about to make a willing exchange of our more treacherous footing. We were about to pass over the dome of snow to the left of the sag and as we supposed directly upon the sky-line. To our surprise, as we approached its summit, we found an entirely different situation from what was anticipated. The true crest of this mass is a palisade of rock lying a little back of the visible snowy one. This latter sweeps gently over to its base.

It was while passing along under this wall that there was prepared for us the most dramatic surprise that I ever experienced on a mountain. Without a moment's warning we found ourselves opposite a breach perhaps fifty feet in width straight through this Titan wall, and our vision, as if suddenly released from bonds, leaped forth into the west over range after range to rest at last upon the grand triple pyramid of Goodsir. Its imposing mass was perfectly framed between the vertical sides of the breach. Four distinct ranges lay between us and it; and what a tremendous gulf between ourselves and the first of these! The snow on which we were standing swept downward at an angle of forty-five degrees, ending in a clear-cut line at the outer face of the palisade. Beyond it lay a depth of air; and then, a half mile away, the dark wall of Mount Yukness, above which we towered so high that we could actually see more nearly to the bottom of the narrow valley next beyond it than to that of the gulf almost at our very feet. Never, not even on Mount Hector, did I experience such an impression of profundity.

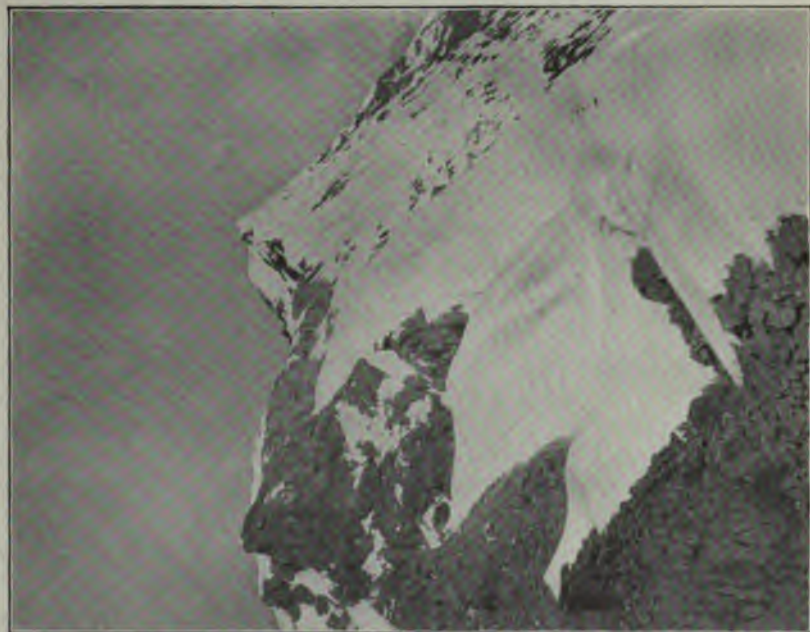
Passing on we reached the point from which the descent is made into the sag, and here paused, this time for photographs. From here the subordinate peak called Mount Huber² is in full

¹ The flat-topped section on the right in Plate II. The breach here mentioned can readily be distinguished as a square white notch about two thirds the distance across it towards the left. The extreme precipitousness of the western side of the range is fully shown.

² In Plate II, Huber is the seeming culmination of the massif, the actual peak

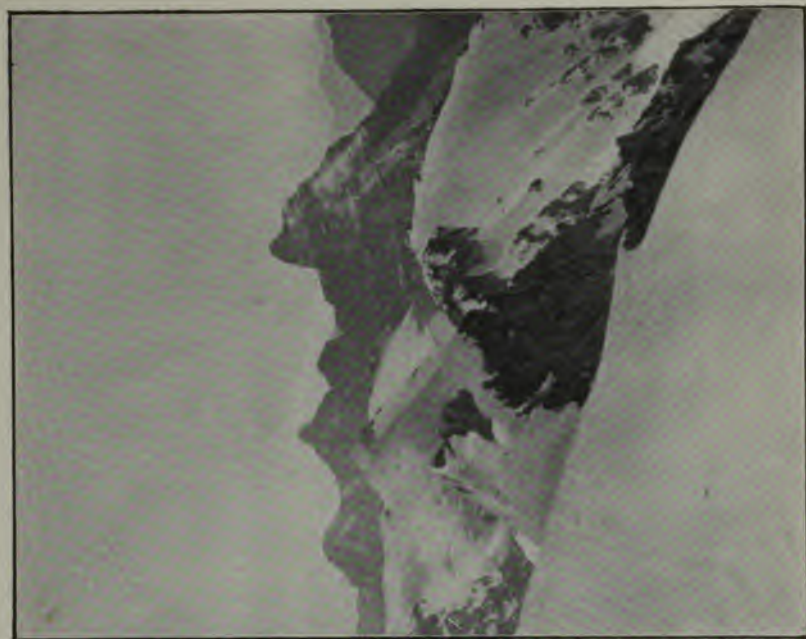


THE MASSIF OF MOUNT VICTORIA FROM THE WEST.
From a Photograph by the Dominion Topographical Survey.



THE PEAK OF MOUNT VICTORIA.

From a Photograph by J. N. Collie.



VIEW SOUTH FROM THE SUMMIT.

From a Photograph by J. N. Collie.

view, rising from a lofty névé-filled basin, which lies between itself and the main ridge of the massif. From our position its decided inferiority was obvious, a matter of perhaps five hundred feet. The snow sweeps clear to its summit on the side towards the basin, and apparently offers a simple way of ascent. But still more did the peak of Victoria itself challenge our attention. Our way to it was now revealed to us; but how different from the easy grade we had been led to expect! How little like "a wall of uniform height!" It towered a graceful pyramidal spire before us. Our line of sight being parallel to the axis of the mountain, we saw in profile the snowy slope that faces Lake Louise. It swept rapidly up from the top of the cliffs at an angle of forty to sixty degrees, steepening yet more as it approached the clearly defined pinnacle. "Hot plates" broke its surface at frequent intervals, with suggestions of imminent avalanches, which will always defend any approach to its icy citadel from this side. Beyond the sag, and several hundred feet higher than where we now stood, was fully disclosed the long stretch of rock wall visible from the Chalet. About midway of this parapet we could see the suggestion of a reëntrant angle. Possibly that angle concealed from us some way of scaling the wall. In any event the natural way of advance, to-day the only safe one, was by an arête of snow which led straight towards this angle from the bottom of the sag into which we were about to descend. It was now about ten o'clock.

If the drop of a hundred feet or so was easy, the climb of the long arête soon depleted any stock of exuberance the lively descent had developed. At every step we sank to the knee, at many a one much deeper. Gratitude to Collie for the pioneer work he was putting in at the head of the line mingled with admiration for his endurance as we "entered into his labors." It was with a decided sense of relief that we at last reached the base of the parapet and found what we had hoped, a point where it could be scaled. Its crest proved to be exceedingly narrow, in places not over a foot wide, and rapidly weathering; nevertheless, it offered a line of rapid advance — the sooner, therefore, to come to an end and compel us once more to take to the snow.

of Victoria being the middle of the nearly horizontal portion of the sky-line to its left.

We were now (about eleven o'clock) at the base of the final peak. From here to the summit we were to move — as indeed we had been doing much of the time hitherto — along the very ridgepole of the North American continent. The snow under our right foot might one day be tossing in the waves of Hudson Bay ; that under the left foot might even sooner, as a part of the Columbia, sweep through its broad embouchure

"Per aver pace co' seguaci sui"

in the Pacific Ocean. A vast panorama was spread on either hand, from the easternmost range of the Rockies to the central chain of the Selkirks. Fascinating was the view down upon Lake Louise, over which all the forenoon the shadow of Mount Fairview had been creeping, like that of the marker of a sundial. There sat the Chalet in a flood of sunlight at the edge of the dark forest that clothes the lake's confining moraine. Doubtless the guests were watching four dusky dots drawing nearer and nearer to their goal. "Stride on, O Collie, we are right after you, and, if it would not seem an impertinence, would gladly transfer to your putteed shanks some of the energy you are saving to ours!"

At last! But why does he not stop? Now that our eyes get level with where his thighs wallow out of the snow, we see we were too sanguine; the highest summit is that hillock, still beyond. One final push, and at 11.45 "the great white peak" is conquered.

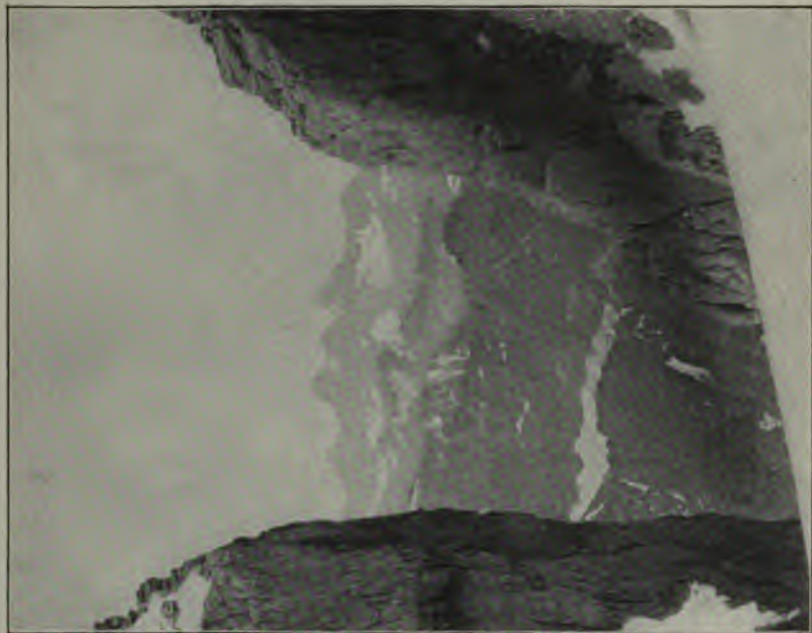
The summit is an ideal one. Discounting the cornice crowning over towards the lake, there was hardly more than comfortable room for our party. Unlike that of Lefroy, no rock pierced the virgin whiteness. To the north it fell away suddenly into a deep depression filled with gendarmes, separating it from a bastion, from which it seems hardly probable it will ever be approached. Immediately to the west a snow arête falls away less rapidly, rising again almost to our level in the most pointed snow peak I have ever seen. The sides meet in the perfect apex of an angle of less than eighty degrees. It seemed as if its point would prick the palm that should be laid upon it. But most majestic, even awesome, was the portion of the view towards which our backs had been turned during our ascent:





FLANK OF LEFROY FROM THE SECOND PARAPET

From a Photograph by J. N. Collie.



THE BREACH IN THE FIRST PARAPET.

From a Photograph by J. N. Collie.

soaring Hungabee; the hardly less amazing pinnacle of Nep-tuak, from behind which peered sullenly the other peaks of the Wenkchemna group; and, nearer at hand, the grand snow-capped pyramidal summit of Mount Temple, rising behind the ice wall of Lefroy. While Dr. Collie set up his mercurial barometer (it gave a reading of 11,400 feet), I put in commission the pocket-level. Of all the visible peaks, excepting perhaps the distant Assiniboine and to the northward others still more remote, Temple was the only one rising to a higher altitude than our own summit. Hungabee and the "scalp" on the right-hand tower of Goodsir appeared to be exactly at our level. To Lefroy it was a slight angle of depression.

Here we passed a half hour between observing, photographing, and enjoying, and then began our descent. Exhilarated by our success we made rapid time over the slopes it had cost so much toil to ascend. Before reaching the parapet, we paused to descend for water to a blue lakelet in the ice just over the crest, the beginning of the descent into the névé basin between Victoria and Huber. Had we been more enterprising, with the ample time at our disposition, we doubtless could have captured Huber also. Coming down the snow couloir by which we had scaled the parapet, Dr. Collie fell to the rear and photographed the others, with the bold wall of the parapet forming one side of the picture and the western face of Lefroy for a background. There it rose, steep and inaccessible, beyond the deep canyon that leads up to the pass. Nearly every step of our late pathway to success was visible: the dark, treacherous outcrops of rock along which the Continental Divide finds its way to the summit ridge, the very line of our advance; between these rocks, those endless stretches of snow, seven or eight hundred feet at a time, up which we had toilfully clambered on the balls of our feet to the ultimate consternation of our *gastrocnemii* and *solei*, and down which we had backed with face to the wall nearly all the way. But what a change had taken place in the single intervening day! Then it was snow; now it was an unbroken wall of gray ice. The entire layer from ten to fifteen inches in depth, then welded to the ice beneath, which had rendered our ascent possible without the cutting of scarcely a step, had meantime evaporated under the

intense rays of the August sun. Our attack had been made in the nick of time. A day later would have made it perilous, and exceedingly toilsome, if not impossible.

Rightfully, then, might we congratulate ourselves while we waited at the scene of our second breakfast for a delicious can of boned turkey to heat, over its own ether-fed stovelet. At the same time we cast our eyes about to fix a final impression of the noble landscape. They rested again on the blue lake. "What was that?" Were our friends at the Chalet entering into our joy and sending their congratulations up to us on the wings of a sunbeam? In our sense of complete possession of all the earth worth the owning, we had fancied admiring, if not envious eyes watching our progress, perhaps not all day long, but at least at frequent intervals. What, then, was our surprise as we landed from the Agnes, at 5.30 o'clock, to learn that it was not until that final rest that the watchful company had succeeded in discovering us. We are sorry for them. They never will know what they have lost. It would have been well worth the while to make the first ascent even by proxy of a mountain like Victoria, and especially in the jubilee year of a royal namesake.

Pipestone Creek and a New Pass to the Upper Bow.

BY GEORGE M. WEED.

Read January 19, 1899.

ON the morning of Saturday, the 30th day of July of last year, six members of the Appalachian Club stepped from the west-bound express of the Canadian Pacific Railway upon the platform of the station house at Laggan in the Canadian Northwest. There were Professor Charles E. Fay, Mr. Rest F. Curtis, Rev. Harry P. Nichols, Rev. Charles L. Noyes, Mr. Charles S. Thompson, and myself. Dr. Collie also, a well-known English mountaineer, then visiting those Canadian mountains for the second season, had come with us from Banff to talk routes and mountains with Thompson; and Wilson, our outfitter and indispensable friend, was on hand to look after our varying needs.

Messrs. Nichols, Noyes, Thompson, and myself composed the party some of whose travels I now relate. Dr. Collie was waiting for two other Englishmen, and was to follow with them in our footsteps into the mountains; while Professor Fay and Mr. Curtis were planning an immediate attack upon Mt. Balfour.

We could have had no more auspicious opening for our excursion than that July day. The sun was warm, not hot, and in that altitude of five thousand feet the air was clear and bracing. To the north stretched the two valleys of the Bow River and the Pipestone Creek, the one on the west the other on the east of Mt. Hector, till they disappeared in the massive background of mountains beyond. Our route lay up the valley of the Pipestone in a direction nearly north from Laggan. Our objective point was the Saskatchewan River and some of the mountains and snow-fields at its source, if attainable in the two weeks of Thompson's vacation; or, if the Saskatchewan proved to be too far north to be reached by us, then we were to go over into the Bow valley and explore some new parts of the Waputehk region.

In a hurried repacking of our luggage, we stowed the essentials for camp life in the packs ready for the horses; and, with the closing of the lids of our trunks, bade farewell to the thoughts and decorous clothing of city life. As the first few miles of the trail into the Pipestone valley lay through burnt timber, where fallen trees made progress for horses especially slow, we had decided to spend the first day, Saturday, at Lake Louise, thus giving our pack-train one day's start of us. A visit to Lake Louise, the ascent of Mt. Piran, and the moonlight walk from the Chalet back to the station at Laggan combined to make our first day one of great pleasure. The next morning found us in excellent spirits, and, after a breakfast at Mrs. Smith's bountiful table, we turned from the highway of civilization towards the wilderness in the north. Somewhere along Pipestone Creek, Ralph Edwards our packer and Wilfred Beatty our cook and the horses were pushing on, and we must find them by night if we would have the comfort of hot tea and the shelter of a blanket.

Over the low foothills the trail of the horses led through the maze of fallen timber which devastating forest fires had left

behind. We climbed over and crept under and circled round the prostrate trees until at last we were on the banks of the creek, in the green woods, where the fire plague had never come.

Although called a creek, the Pipestone is worthy of the dignity of river, for it is a considerable body of water draining a valley thirty miles perhaps in length. As we followed along this river, many times we looked back out of the valley and saw the forms of Lefroy, Victoria, and Hungabee. There they stood in their majesty, the last familiar points of land in sight, and were not lost to view until we passed, on our second day, beyond a sharp bend in the valley.

All this day, our general course was almost straight to the north. At times the river ran between low wooded hills, and only over the tops of the trees could the mountains be seen. But in the afternoon we stood at the edge of the woods, where the valley opened out before us into a broad flat basin, over which the stream found many channels. Far ahead, the mountains seemed to close in on the right, leaving us no alternative but the path to the left, which the afternoon sun illumined. We reckoned that Edwards could not now be far away, and we did not wish to pass the camp. We had followed the horses' tracks to the edge of this basin, but with a last upturned sod they disappeared. After a fruitless search we decided to go around the farther end, and there if possible pick up the lost trail. Our hunt was successful; among the distant trees we again found sure signs of recent visitors. A short tramp through the woods soon brought us opposite an open place where we discovered the smoke of Beatty's fire. A shout brought Edwards with some horses to the ford, and one by one we crossed to this, our first camp.

Life in camp in the Rockies affords some luxuries which cannot be found in more civilized places. No baths of Pompeii ever held purer water than the brooks of the Pipestone, Siffleur, and Bow valleys, and no decorated walls could ever equal the magnificent setting of our camps.

On Monday morning we intended our whole company should get under way together. But, before the packs could be placed, the river had to be forded once more; and then for an hour on the shaded slope of a hill, while waiting impatiently for our

caravan to appear, we brushed away the flies and discussed the possibilities and pleasures of the days to come. At last our reunited party was on the march. In the afternoon we turned the corner in the valley, and our course then lay to the west of north. The mountains on either side were closing in upon us, and our rise into the upper levels of the valley was very rapid. Not far beyond the bend in the valley we pitched our tent, where a steep cliff covered with broken stone was on one side, and on the other across the river a well-wooded slope. Down the valley a glacier, which earlier in the day had hung far above us on the mountain, now seemed no higher than we were.

As we had ended our day's march at an early hour, enough time was left for an ascent of the barren bluff that stood before our very door; and a rough scramble of an hour over loose rock brought us to the lowest part of its sharp ridge. But from this height we saw across the valley and above the wooded slope a long level alp carpeted with tenderest green. At one end it touched the snow, and at the other bordered a peaceful little lake. Will not a chalet there some day tempt many a visitor from the old and beaten paths?

On Tuesday morning we were ascending rapidly to the level of this alpine pasture. The steep places made hard work for the horses, whose packs were still heavy with bacon and meal.

At last we emerged into the broad and open region of the upper valley. What we had seen the day before was only a prophecy of what we now beheld. Alp beyond alp stretched away as far as the eye could follow. Not a tree grew in these broad fields, though beneath our feet and on every side flowers beautiful and abundant strewed the ground. Never shall we lose the memory of those forget-me-nots, with their blue faces, in riotous profusion, fascinating our eyes at every step. Our tender-hearted Beatty, a far wanderer from friends and kindred, hid the imperfections of his hat under masses of flowers, each fresh bunch looking more goodly than the last in his eyes. Nichols and Noyes told off the name of each new-found treasure; but the names were as nothing to the delicate color and fragrance of those alpine friends.

From the forget-me-nots to the barren rocks and the snow was

a short journey only. The riven glacier that we saw from our camp of the previous night was falling far behind, and the protruding spurs of the mountains near by were fast pushing out between us and the valley; but just ahead was the height of the pass; and across gravel and rock we hastened, curious to get the first glimpse into a new land. At length we stepped upon the snow that lay in the very summit of the Pipestone Pass, and looked over into the rough and wild valley of the Siffleur. Mountain succeeded mountain on our left as far as we could see, and, even if we had so wished, we could not have climbed with our horses those precipitous slopes for a short cut to the Bow River. We ate our lunch in the pass at an elevation of about 8100 feet. The warmth of the sun was not unwelcome, and the hot coffee made over Thompson's lamp was a cheering drink after the work and excitement of the morning.

Below the pass we found the broad valley stretching into the northwest a different kind of country from that of the Pipestone. No alps dressed with flowers lay at our feet, but miles of rocks, with here and there a patch of moss and grass. The only animal life that we saw here were the marmots, whistling shrilly at our approach; or an occasional rock pigeon, walking slowly over the barrenness. Farther down the valley the rocks gave way to green grass, and then we were soon among the forests again. We stopped for a few minutes by the side of a little pond, where a dozen ducks were quietly feeding. So little did they know mankind that they made no effort to fly, but merely raised their heads in surprise when we came near. It was only by a frantic waving of the arms that they could be persuaded to swim into a better position to have their photographs taken.

At evening we pitched our tent a half day's journey down the valley of the Siffleur. We were in the midst of a marsh. Water seemed to pour from the ground at every turn, and every tuft of grass was a sponge. Edwards had, however, discovered the one dry spot in many acres of bog, some distance above the trail and on the sloping side of the valley, and our island furnished room enough for kitchen and bedroom, but none to spare. Among the visitors to this camp were many little mice which took a great fancy to some of our stores. One of them,



VIEW SOUTH FROM PIPESTONE PASS.

From a Photograph by C. S. Thompson.



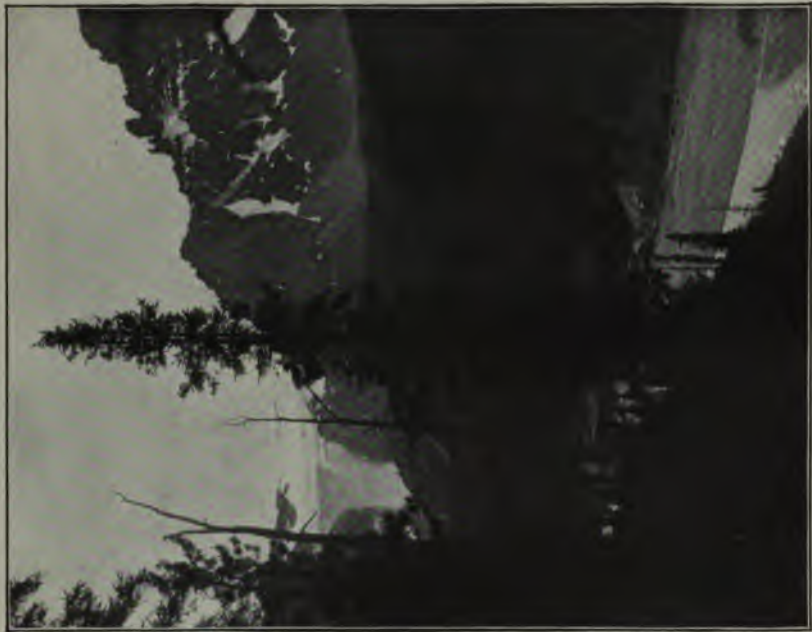
VIEW NORTH FROM PIPESTONE PASS.

From a Photograph by C. S. Thompson.



UPPER CANYON OF DOLOMITE STREAM.

From a Photograph by C. S. Thompson.



LOWER CANYON OF DOLOMITE STREAM.

From a Photograph by C. S. Thompson.

which Thompson had befriended, we immortalized in a photograph.

The next day our path lay through the woods, though occasionally a bit of open country intervened. As we descended we followed along the east side of the valley, leaving the river below us and at our left hand. Out over the trees we could see far ahead the mountains beyond the lower part of the valley, and we wondered if they overlooked the Saskatchewan River. At last the trail led down the steep slope; we broke through the thick underbrush, and, stepping upon a flat piece of ground, saw on the farther side of it a wide and rushing stream. Was this the Saskatchewan? It was hardly so large a river as the Saskatchewan should be; and, furthermore, it flowed almost north, whereas the Saskatchewan should be making toward the east or south. Even Thompson could hardly believe the compass.

But a big cloud was fast coming up the valley, and, dropping our speculations for the time, we worked with a will to get our packs off from the horses and under the shelter of the canvas tents. We put on our rubber coats just in time, for the rain fell in torrents in the next half hour as the storm passed overhead. In the midst of the shower, however, Beatty was getting ready our lunch, and he even made a fire in spite of the wet wood. While we ate, we returned to the discussion of our next move. It was noon of Wednesday. If this river was the Saskatchewan, we should by all means ascend it. Again, if the Saskatchewan was still far to the north, could we afford the time to find it, if we hoped to do any climbing and yet save Thompson's repute at the home office? These latter arguments finally prevailed, and, with many a longing look down that deep, broad valley to the north, we decided to turn our faces to the south. Just above the place where we lunched, we forded our old friend the Siffleur once more, riding one by one behind Edwards on his patient mare.

All the afternoon we travelled up the right bank of this new river, which we were now persuaded was not the Saskatchewan, and which for want of a better name we called "our stream." It was dirty, turbulent, and full of the drift brought from many a glacier's bed. Above it on either side rose the walls of the

valley, though from our position on its right bank we could see well only the ridges and mountains that were on the side opposite to us. But there in unbroken succession peak followed peak, the dulness of the color of the rock relieved by the green slopes below and the whiteness of the snow and ice. As the afternoon wore away, a glacier appeared far ahead, the farthest point in the valley in our view. And then our path opened upon the shore of a long green lake, the glacier showing just over a foothill at its farther end. It was nearly time for the sun to set in the valley, so we found a clearing on the steep slope just above the lake, and there set our camp. Thompson at once had a title for this body of water which we had discovered, and it is to be known henceforth as "Isabella."

Beatty ministered bountifully to our wants at breakfast, and then, while he and Edwards loaded the packs once more upon the horses, Thompson and Noyes tried to preserve in their cameras some suggestions of the beauty of the scene before us. Diagonally across and up the valley "Mount Silverhorn" showed its tip of rock just emerging from a long field of snow. To the left of it ran a long ridge of rock and ice ending in the gateway, through which a hanging glacier crept over into the valley.

We were soon started on the trail, however, with this hanging glacier straight ahead. Whether we walked near the broad, gravelly bed of the river or climbed high on the rocks above, it appeared always the same, like a great torrent pouring in whitest foam through this portal of the mountains. As we drew near its foot, a backward glance showed the winding stream that we had been following, a bit of the wild valley, and, high above, Silverhorn, whose band of snow now appeared to be but a spot of white.

But now came a revelation to perplex the minds of our geographers, for our valley turned away from the glacier and ascended towards the southeast. To have been travelling almost south, leaving the Saskatchewan farther and farther behind, was bad enough; but now to be led by this innocent valley to the southeast was a poser even for our leader. Was there a chance that from the head of this valley we should look over an impassable wall into that of the Siffleur? or should we find an outlet

to the west either to the shores of the Bow River, or into the valley which lay next north of the Bow? There was a measure of delight in the uncertainty, for to make a new pass from the Siffleur to the Bow would be only a little less than taking a peak.

Our river now became smaller, for we had passed its confluence with the stream from the hanging glacier. The views before us up the ravine were beautiful and striking; for, as far as we could see, the stream lay like a waving ribbon in the bright sunlight, and a mountain in the distance seemed to stand into the valley as though to block our way. Later, from a nearer point, we became much better acquainted with its steep sides; for it was at its foot, at a point where mountains on either hand crowd the river into a narrow bed, that our camp of the next two nights was pitched. But travelling up this rugged, trailless valley was slow work for our horses; and, in our eagerness to see the new country beyond, we kept neither with the horses nor with each other. Nichols soon was missing. We lunched at noon without him, sorry not to share with him our apricots and bacon. But early in the afternoon, at a bend in the river, we overtook him. He had not gone hungry, for his pockets always carried a seemingly limitless supply of raisins, chocolate, and crackers.

We started together once more, but soon each man was setting his own pace and finding his own path. After several hours of rough walking, first along the stream, then high above it, avoiding ravines and ugly slopes of loose rock, Noyes and I chanced to meet and together pushed on. We were then nearly at the tree line, and every step was taking us towards the open upper valley. In a V between a mountain and a low hill, we saw far ahead an impassable escarpment crowned with ice and snow; and just peeping over the hill were the tips of the mountains that we felt sure must stand at the very head of the valley.

Soon we found ourselves in a pocket in the rocks, where the torrent came tumbling toward us through a gateway. To climb out of this pocket we waded through the icy water, scrambled up a steep slope of gravel, and gained the height of land beyond. At our feet, and extending to the glacier at the base of

those mountains whose tops we had seen not long before, was the level bed of what had once probably been a lake, over which the waters of our stream ran in half a dozen different channels. Still we had not seen an egress from our valley. Stopping, therefore, only long enough to admire Mount Observation, a peak half snow, half rock, looming above the western wall of our valley, we hurried up a white hill of rock that lay to our left, and, once on its top, received our reward. For the low rays of the setting sun (it was then about seven o'clock) came pouring through a wide opening in the western wall, and made rich the soft green slopes that lay in the hollow of a new-found pass. We were indeed happy, for not till that moment could we feel reasonably sure that both horses and men would not need to retrace some of their steps, but would find a passable route from this strange valley into the region of the Bow. Of course there was still the chance that we were farther to the north than the Bow valley, but that question would be easily settled by the morrow.

As the night was fast coming on, we had a few minutes only for a more careful view. To the south of the pass rose those dolomite peaks towards which we had travelled all the afternoon, and from which we have named the pass and stream, and then, in continuous line to the east, ranged the rugged, unnamed mountains beyond which somewhere must be the valley of the Siffleur. Not far distant from us, and nestling into a rocky basin, lay a dark-blue lake, to be named "Lady Alice." We were tempted to make it a twilight visit, but the gathering shadows warned us that it was time to go in search of our camp. We descended from our hill of observation, and, after two hours or more of rapid walking, Beatty's cheerful fire disclosed the outline of a tent and two men.

We had not long been enjoying the genial warmth of the fire, with a cup of tea, when a shout from the farther side of the river warned us of the presence of Thompson and Edwards, who wished to cross the stream dry-shod. They also had been up the valley, had found the lake, and had returned by the left bank of the river. And now, before a rousing fire, in the last hours of the evening, we related our adventures of the afternoon, and made our future plans in accordance with our new know-



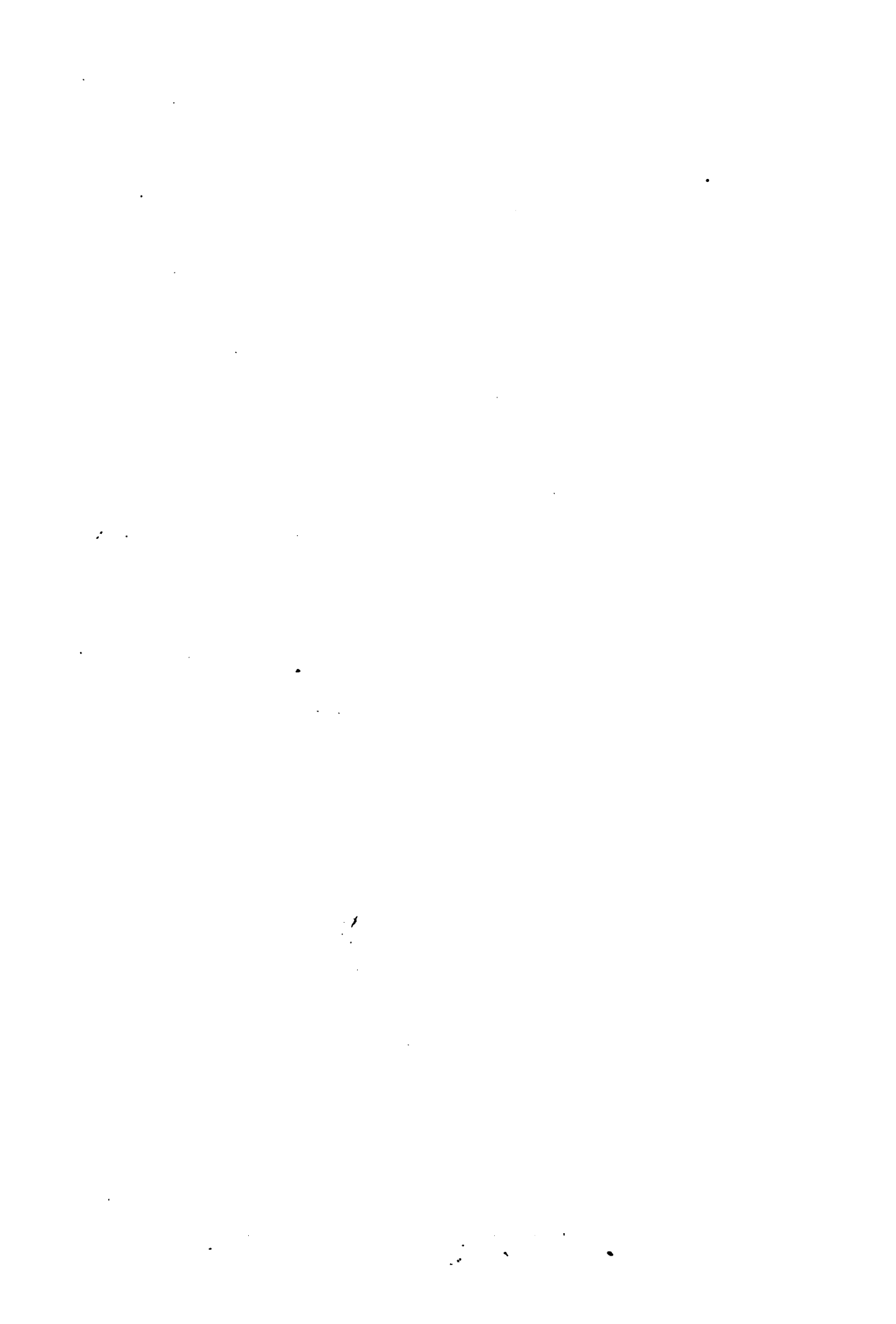
EAST FACE OF DOLOMITE PEAK.

From a Photograph by C. S. Thompson.



VIEW WEST FROM DOLOMITE PASS.

From a Photograph by C. S. Thompson.



ledge. Friday should be given to the ascent of Mount Observation, and Saturday to making the pass.

It took all Saturday to move our camp from the valley up into the pass, so difficult was the trip for the horses. There were thick masses of evergreens to break through; steep slopes, covered with large and ragged pieces of rock or with treacherous shale, to be traversed; and up and down the rough sides of the upper valley the horses picked their way slowly and carefully. But in safety at last we reached the broad bed of the stream in the upper valley, and, following this, soon came to the undulating pastures that lay at the head of the pass. Here we camped, for it was late afternoon. Not a tree nor a bush was in sight. Not a tent-pole could be got. Not a twig even, for a fire, could be found. So we ate a cold supper, save for a little tea from Thompson's spirit-lamp, and lay down in our blankets with no tent between us and the glories of the heavens. We slept that night contented and peaceful. For, whatever misgivings we may have had at our failure to find the Saskatchewan, the week of most delightful wandering in strange places found us at its close in the height of an untried pass, at an altitude of 8100 feet, and with an easy descent ahead into the valley of the Bow River, near the upper lake.

Sunday morning dawned with a slight haze spreading over the mountains; but we could hardly complain, for we had had eight perfect days, and it was only the most distant peaks that now had lost their clear-cut outlines.

It is hard to describe adequately the scene from our camp. Just at the foot of the slope which we had made our bed, the placid blue waters of Lake Katherine spread to the very edge of the pass, over which it tumbled and with many leaps joined the main stream far down in the valley. Over this lake and in the far distance rose the mountains that form the western boundary of the Bow valley. At the left of our lake rose abruptly a series of dolomite peaks, and then, beyond a small green pool which we called the "Dolomite Tarn," we could see a small part of the glacier on the north side of the dolomite peaks that had appeared to Noyes and me at the time of our first scramble up the valley. And then, still turning to the left, we saw the great and rugged mountains which now stood like

the walls of a vast amphitheatre, in which our camping ground was the stage. To complete the panorama, our eyes rested upon the summit to the north, whose broken side showed with great distinctness the tearing might of nature.

The task of piloting the horses safely down the steep rocky slope from our pass to the shores of "Lake Ethel" was soon performed, and, skirting its border, we passed from a region of barren rock to the luxuriant verdure of the valley.

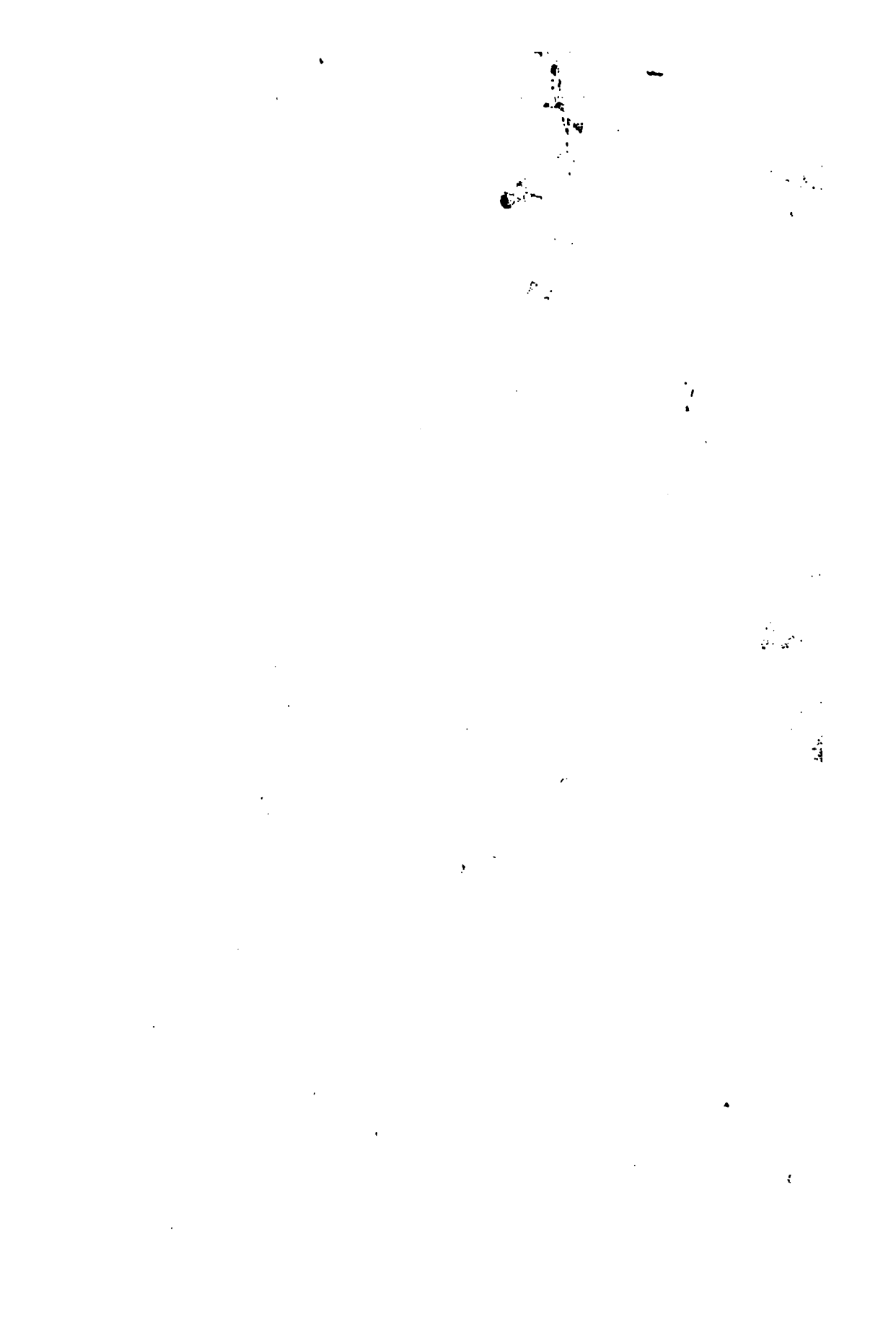
A long circuitous route along the side of a mountain and then a turn to the northwest brought us in a few hours to the shores of the Upper Bow Lake. This was familiar ground to Noyes and Thompson, but Nichols and I now saw for the first time those glacial entrances to the Waputehk snow-field, to explore which we were to devote the few days remaining. It was in the late afternoon of the second Sunday since our departure from Laggan when we pitched our tents at the northern end of the lake, but while daylight lasted we enjoyed in repose the grand scene of lake and glacier and mountains.

Mount Balfour and the Waputehk Snow-field.

By CHARLES L. NOYES.

Read December, 1898.

THE Waputehk snow-field must have cast something of its potent spell over readers of APPALACHIA, who, by the graphic narrative of Mr. Thompson, were last year taken to the level of that vast white plain uplifted on the shoulders, and spread around the crests and peaks, of many untouched mountains. Pressed close under the eastern escarpment of this upland are three lakes of nearly equal size, whose broad expanses open noble views, and glaciers afford almost the only breach for assault from that side. Through each of these we forced an entrance for our three forays into the field during the summer of 1898, the first by the middle one, the Upper Bow Lake. Our party of four came down, as described by Mr. Weed, out of the Dolomite Pass, and pitched camp at the old spot in the angle of the northern shore, on the afternoon of August 6. By nine o'clock the





THE SUMMIT OF MOUNT COLLIE.
From a Photograph by C. S. Thompson.

next morning we had reached the level of the snow-field by last year's route up the glacier at the head of the lake. There was the same skirting round the shore between water and bush, the clamber over the old wooded terminal moraine, the diagonal traverse of the glacier to its first shelf, and the ugly scramble along the arête of the southern lateral moraine to the fine table of the second shelf, then a diagonal course again north to the abutment of Portal Peak, where the ice begins to break over for its first fall. Thence we moved westerly along a slightly rising grade to a long line of outcropping rock rising to a low peak, which, seen from the opposite side of the Wapta névé, is found to be the coping of an imposing palisade that points the way, and at last ends in a fine peak beyond the divide, commanding the snow-field towards Howse Pass on the west, and on the east that feeding the glacier of Peyto's Lake, over which it is seen the principal feature on the farther skyline. This fine massive mountain, the monarch of the upper level of the snow-field in its northern area, as Gordon is in the southern and Collie in the western, and the peer of these summits, we named Baker.

At the outcrop of rocks we lunched, and from the vantage-ground of their elevation, about 1000 feet above the average level of the field, which the aneroid made to be not far from 8000, took bearings for map upon principal points. A radius of rather less than two miles swept round from this point would about touch the summits of Portal, northeast; Beechy Head, the opposite abutment of the glacier, due east; then Olive and the rocky peak of Gordon, south 37° east. It would but half reach to Collie, slightly south of west; a third the way to Habel, as we now name Hidden; and not quite touch Baker, concealed from us then by the rise in the palisaded ridge.

We parleyed what should be our next move. The easy ascent of the glacier and our careful survey of the field gave it a changed aspect. It contracted a little as we came to understand it; at any rate, it now lay well in the embrace of our knowledge, and the vague idea of peaks indefinite in number gave way to the sense that we could place and identify nearly all. We had a care-free feeling, as though the brunt of our task for the day was done, and we could give ourselves to any mountain

sport we chose. In looking about for this, our eyes fell on Col-lie, a richly contoured mountain, with much strong individuality of feature worthy its name, terminating in a snow arête running in a waving line to the final peak, that promised a very interesting close to a climbing adventure. It was not much after ten o'clock when we set our faces toward it, and it took us two hours to cross the fast-softening snow of the Wapta névé, as hot a trudge as I remember. Every removable garment was stripped off, and we made a pretence of keeping our heads cool with snow packed in the indented hat-crowns, but it melted and left the felt dry almost as quick, it seemed, as if it had been laid on a hot stove. As we drew near, we could see that the features that had given interest to the mountain's surface were each an obstruction,—the lines of shadow, schrunds, and the black patches relieving the white, steep faces of grat that peremptorily blocked the way. Working up as close and high under these as we could, we turned abruptly to the left and outflanked them by a traverse to the southeasterly face of the mountain. This we found to be a broad, shallow trough of snow, tipped up at first gently, but with an ever stronger pitch until it ended abruptly in the steep face of the final arête that ran across from east to west. From the summit there ran down along the western border of this concave floor of snow a high and steeply faced ridge, which met the snow only well at the foot. It is not impossible that a line of ascent might be found along this ridge, but not likely. The obvious route was up the snow to the low outcropping rocks near the right hand upper corner, which seemed to join, feasibly for a climber's purposes, with the final arête. This way, simple as it looked, developed difficulties which checked progress all the way and grew quite tantalizing. The snow was very soft, and seemed unstable to indefinite depths. Soon we found ourselves in to the thighs and going deeper at every step. This was not only disagreeable, but seemed dangerous, and proved so; for our footing was shelving down to the brink of a crevasse, into which the thrust of the axe at last broke so suddenly that the leader was glad of the steadying check of the rope from behind. This brusque stop was the more baffling because there was no surface sign of crevasse; and as there turned out to be quite a series of them, run-



CASCADES ABOVE PEYTO'S LAKE.

From a Photograph by C. S. Thompson.



PEYTO'S LAKE.

From a Photograph by C. S. Thompson.

ning irregularly, with connecting bridges thoroughly hidden by soft snow lying deep above, we could not see, but had literally to feel our way with scrupulous caution. A way there was, and at last, after much greater waste of time and patience than we could have forecast, we reached the gray ice above, where the clefts were at any rate visible, and where rills of water gave us a drink to moisten a most welcome lunch.

Refreshed in body, we craved a tonic for the spirits, too long thwarted and hedged about, in a free outlook, and this, too, we quickly found in the view which burst upon us as we gained the outcrop of rock above the verge of the escarpment which breaks down northward.

The edge soon rose into a parapet, along which we had to slab our way on crumbling screes of icy footing above the jaws of ragged schrunds. But the snow arête was close at hand, and we promised ourselves a cleaner if still stiff piece of climbing there. But it proved the turning point of our ascent and day's progress. Before we had made a rod along its edge, we found it undermined by a cavernous schrund; beyond, it presented a nice dilemma between its crest dangerously corniced and a traverse over ice very steep and lubricated by melting snow; and so on to the top the whole way bristled with obstructions, each of which, manœuvred past, would only lead to the next, as difficult or dangerous. It is more than likely that, in the abundant snow of a cooler season, this passage might prove as feasible as our fancy had painted it. It is not impossible that it might have been done then, could the task have been taken in hand early in the day. As it was, we could hardly allow ourselves time for debate; for it was four o'clock, and there was not left enough daylight to reach our camp before ten o'clock, an hour after it had grown too dark to travel along the lake shore without vexatious if not painful results.

The morning found us refreshed and restored to more Christian temper, and by noon we had moved our caravan by an open, gently rising way to the height of land between the valleys of the Bow and Saskatchewan. The summit of this pass is an extensive, nearly level plateau, set with cedars singly or in clumps, leaving pleasant glades or deeper vistas between, — a natural park, which it is a comfort to think no commission will ever

improve for the worse, — with a genial charm, in singular contrast with the scenery out of which we had come the day before, and, indeed, the grandeur of prospect in which it abruptly ends. If the traveller will trend to the left as he threads his way among the open spaces between these cedar groves, so as to come out on the edge of this plateau at its northwestern corner, he will be greeted with one of the most magnificent surprises that the manifold resources of mountain scenery can achieve. This is Point Lookout. Abreast of here, the plain drops down suddenly in steep, densely wooded ridges and gorges to the blue waters of Peyto's Lake, shaped like a bended arm. The upper reach opens a view gradually expanding over a grand, sinuous glacier into the heart of the snow-field. The lower leads the eye down a widening vista, lined above by a file of nobly tapered peaks; while, below, the outlet stream bands the intervale with its broken strands, halts in lake-like expansions, and, gathering itself in one channel, moves sluggishly on to find the Saskatchewan, out of sight in the far haze, but giving portent of its greatness in the amplitude of this valley of its lesser fork.

We spent our afternoon along the shores of the lake, getting many fine compensating views, and laying plans for the ascent of the glacier the next day. The shore is made so irregular by many transverse ridges of old terminal moraines, that pitch sharply down and intrude far into the lake, that we saw it would be slow and toilsome work to reach the head, winding in and out of these indentations, or climbing the steep sides of these obstructions. We therefore decided to make a high traverse down from Lookout Point. As near it as convenient, in the shelter of a cosy nook in the park, we set our camp, and, starting as early as dawn would permit, found no difficulty in getting to the head of the lake; but here, just as at Upper Bow, the wooded dike of an old moraine crowds over to the face of the mountain opposite the glacial stream, which has wrested a passage for itself, and angrily tears through the narrow gap, pouring a large flood into the lake. After surmounting the barrier, we were forced by the stream, too deep to wade, back to the southern corner of the glacier, where in full volume it rushes out from the mouth of a splendid ice-cave.

The ascent of this glacier, the most impressive, both because

of its dimensions and the noble flow of its lines, that I have visited, is safe and easy. A diagonal traverse of comfortable grade, over ice hardly at all broken by crevasses, leads to the northern lateral moraine, which in turn gives a ready means of ascent to the great upper ice-plain. The climb of a moraine is always drudgery, but here it is beguiled by a spectacle at once beautiful and curious at the climber's right. In a pocket hidden behind the lofty, precipitous wall is a lovely blue lake, which we had noted from Mount Observation. Its clear waters find a double outlet, one by a flume worn through the ridge; the other breaks a way through the mountain side, and gushes from its face in full, sparkling tide, a constant miracle of water drawn from the rock.

The march over the upper ice-plain we found most exhilarating. It is the grandest approach by which we had reached the snow-field, with dimensions really magnificent, gathering into its mighty ice-current the tributary snows from right and left with lordly sweeps of curve. The surface is scored over by countless limpid rills that meet in actual rivers and dive down clefts that pierce to the heart of the frozen Tartarus below, or, more beautiful still, circular wells with emerald walls, wonderful specimens of "moulin," down which pour swirling waters. All these singing waters set the ice a-ringing, and, instead of a domain frozen into silence and death that one might expect, the glacier is vocal and resonant, like some mighty statue of Memnon, smitten into music by the melting heat of the sun's rays. This vestibule to the snow-field is set about with some fine peaks. On either hand are heights ranking with Portal, while in front, as I have explained, rises Baker, one of the monarchs of the snow-field. Seeming its equal, though only because it is nearer, stands a snow-clothed peak, with a unique feature, very impressive and pleasing. Its snow arête sweeps round in a wide spiral curve of even grade from crown to base, a white winding stair, that fairly beckons the climber to improve its offered access. With regret we turned from this, and all of these northern peaks, to make our day's work tell in the direction of Balfour, the base of which we must reach immediately if we were to reserve time enough to attempt its capture. We had sent the men and horses down to have camp ready for us that

night at the Lower Bow Lake, which we hoped to reach by a traverse of the snow-field along its greater axis from north to south, through Vulture Col, between Gordon and Olive, down to the lower level about the skirts of Balfour, and thence to the lake.

The walk to Gordon was the usual monotony of tramping over glaring, soft snow. At what we called the highest point of the snow-field, on a line running slightly south of west from the peak north of Portal (later climbed by Dr. Collie), to the ridge of the palisades, which makes the snow divide between Upper Bow and Peyto's Lake, we took bearings useful for the map, and found the aneroid reading nine thousand feet. Beyond the head of Upper Bow glacier, we were forced to feel our way with caution, prodding for firm footing between masked crevasses, which scored the field over this hot season, and made it quite another thing, for the mountaineer, from the plain, straightforward going of a year before. Another tell-tale sign of the great melting, which made this a year of scant and unstable snow above and flooded stream below, was an emerald lake of respectable size gathered in a depression of the snow under Gordon. Our first looks by the western shoulder of this mountain through Vulture Col vetoed for us further advance. It was mid-afternoon; the descent from the Col, while seeming feasible, threatened to take time; but as we tried to trace a route onward to any access to the Lower Bow, we would always find it broken by some positive obstruction. The result of this reconnoissance we found confirmed later when from the base of Balfour we looked back over the same area. From that side one only route seemed within limits of possibility, a rapid drop from cliff to cliff to the head of the lake on its northern side. We paused a few moments, fascinated by the view, the blue lake deep-set in its oblong chalice, the broad valley sweeping south, springing upward directly from its floor the supreme height and richly moulded mass of Hector, opposite — *par nobile fratrū* — Balfour, a recumbent giant, outstretched on his superb divan, head and shoulders upraised, body and limbs sloping away, to be lost under the coverlid of snow which draped the sides as well and overhung the walls of his mountain platform. Balfour, indeed, concentrates and absorbs the attention, filling



MOUNT BALFOUR FROM VULTURE COL.

From a Photograph by C. S. Thompson.

the whole picture for one looking through this opening, a portrait framed in the V of the col. It was for us, besides, the object of ambitious interest, and we scanned its eastern slope, for some line of ascent, with dismay, as everywhere the ridge on that side seemed defended by a complicated series of fortifications worthy of the malicious ingenuity of the Spaniard; but where the ridge died away in the snow at the south opened a gateway through which we could go, in the hope of better conditions of approach on the western slope.

The vision of the task that lay before us, as well as the approach of evening, gave speed to our feet as, with backs turned toward Balfour, but its summit still in mental view as our goal, we made haste as best we could over the treacherous way to our old camping spot on the Upper Bow. In view of just this frustration of our too ambitious plan, we had arranged to have a ration apiece *cached*, and a little wood gathered on the camp knoll by Edwards as he passed, so we did not fear being supperless, though we must pass the night without blankets or shelter. This even did not seem a pleasant prospect, as the cool of evening sent a chill to feet and limbs, reminding us that it was many hours since they had been dry. Imagine, then, our astonishment as we saw from the lake shore the outlines of a tent strangely shaped and set, and the fitful gleams of a fire at the camp-ground. It struck us as uncanny, so unaccountable it seemed. Mr. Weed, whose eyes were too inflamed for snow work that day, had gone down with Ralph and Beattie, and we felt sure they would not have failed of their appointment with us at the Lower Bow by halting here. Might it be Fay and Curtis, who in the gayety of success in doing Balfour had come over by some magical route to meet us here? or perhaps Collie, or a fragment of his party, forced for some reason to turn back from their quarry of great peaks beyond the Saskatchewan? or had Wilson really fulfilled his rash promise and come up to meet us? or was some more ill-omened agency weaving a spell over our sight? or perhaps, as our psychical research friends would prove, it was but the physical craving for warmth and food working up from limbs and stomach to visualize itself in this phantasm of the brain? None of these, but something as substantial and human as Weed, seated by a fire in the midst

of a very palatable array of eatables! As we stumbled up the bank silently, sudden apparitions out of the darkness, all the troubling surmises that had perplexed us seemed reflected in his astonished face. The little cook, Beattie, who had been overdoing, taking rather more than his share of the work, had at last given out, and could get no farther than this camp. Ralph had been sent down to meet us, while Weed had stayed behind with Beattie and part of the kit. He had already set up half the Mummery tent over against the fire, and Beattie, wrapped in blankets, was sleeping feverishly. After a good supper, sweeter for being so unexpected, we rigged the other half of the Mummery on the opposite side of the fire, quarreled to make the other man take what there was of coverings, rolled close together, feet to the fire, and, if the night was short and sleepless, by daylight none knew the difference in that air, tonic enough to serve as sleep and food as well. By noon the next day Ralph arrived, evidently relieved to find us alive and all together. Beattie was now able to ride, and much too late in the afternoon we set out for the Lower Bow. Darkness caught us just where a blow-down had effaced the trail, and for the rest of the way it had to be every man for himself, floundering through brush and pitfall and rock and streams, until near midnight, when we reached the one scant island in the ocean of bog and river where camping ground is possible, by the outlet of Lower Bow. There was hardly a garment on any of us that was either dry or whole, and, worse still, so little of the night was left that Balfour was out of question for the next day. We turned the morrow to good use in repairing rents and injuries, catching a good mess of rainbow trout, having Beattie bake a supply of bannocks for the climb, and, as the day before, enjoying something like leisure for the first time, so greedily had we used our hours for work, since leaving Laggan. We also greatly improved our chances of success the next day by pushing forward a little camp — Mummery tent, blankets, and food enough for a supper and breakfast — as far as we could along the western shore of the lake, to a point just this side of the outlet of the little lakes above, by which lay our upward route.

By rising at three, we had time to prepare and eat a comfort-

able hot breakfast, oatmeal and chocolate, and get off by four. A diagonal course, slabbing up over the ridge intervening between this point and the outlet of Margaret, brought us to that lake by the easiest route. The sun had not yet touched its waters into beauty, and they lay a cold, sombre blue. It may have been six o'clock when we were climbing the scree at the head of the lake, and after seven when, by the one rock-ladder, we scaled the wall above, and came over the outer rim of Lake Turquoise, — "a joy forever." It was not far from eight when we stopped for lunch at the foot of the glacier above. Mr. Nichols had left us at Turquoise. He was feeling the effects of a blow on the spine, got in a fall on a slippery rock while bathing in Lake Katherine. It did not seem to him wise to risk the strain of a longer climb; and there was so much to charm and occupy in the beauties of Turquoise and its setting, that he proposed to spend the day about there, and bade us God speed, with a solemn injunction that we should meet him at six o'clock above the verge of the lake to go down the ladder together. The passage of the glacier was this year a delicate operation, taking some ingenious warping among crevasses, and light stepping over bridges, which needed but to melt a little more to almost cut off access to the névé above. This gained, full in view beyond it, broadside to us, rose the magnificent mass of Balfour. The difficulties of approach, which we had foreseen looking down from Vulture Col, by no means vanished. The final ridge, however, looked hopeful, promising us, if once on it, a clear way to the summit; but how to reach the ridge? Well to the south was the most encouraging route in view. Rising almost to the crest was a tongue of snow, but it was suspiciously gashed, and, once upon the ridge, there was no surety that the way would not be barred by cornices or precipitous breaks. The prospect was too doubtful to waste time in considering, and without slackening our steps we pressed on over the névé to the gateway at the south, which would let us through to the western side, where we had reason to hope we might find more level and stable snow, giving access to the final ridge. It was eleven o'clock when we broke over the divide, and the change of worlds of vision, always thrilling in such a crossing, was grandly so in this case. To the south rose, near and imposing, Niles and Daly,

like mammoth walruses, lifting their black heads above the ice, and thrusting their great snouts toward us; between them the névé sloped down to some glacier, and by them to the west rolled a vast snow-field toward the ravine of the Wapta, that enormous rent between the mountains, gathering into its bosom the immense volume of melted snow poured down from all the névés streaming off the western side of Balfour and Gordon, Collie and Habel, to the north; and over beyond, from the hither slopes of another system of mountains that filled the prospect to the horizon west and south. For all this we hardly had eyes at first; they were turned instantly toward our goal; and when they ran over a clear reach of snow leading to a ridge curving off from the main arête to the left, above which foreshortened could be seen the summit, as it seemed readily attainable, only the nonchalance of our tones betrayed our excitement as we remarked, "We're going to make it." We did make it, but it took four hours. The offshoot ridge once gained, there was along its curve an even, almost level way to the backbone of the mountain. On this main arête there was more difficulty; a V-shaped cleft promised to block the passage altogether, but we circumvented it by slabbing down to the scree and snow below, and diagonally up again, over unstable and tricky footing, and with unreliable hand-holds on friable rock, all done without slip or danger, up to a depression in the ridge, where greeted us a reviving view Hector-ward, and a pool of water made by the snow-shelf on the eastern side, melting against the warm rocks. This invited to a final lunch, refreshed by which we rose for our last hour's climb to a height much greater than Balfour, — the summit of our summer's adventure and success.

Any one who has walked the ridge of the Presidential Range will know the thrilling sensation of such a passage, as though one were moving on the backbone of the world. Suppose it is really a bit of the coping of the continent, lifted toward eleven thousand feet, thinned down till it is no more than the fine edge of a wedge protruding through slopes of snow that cling to its sides high as the steepness will allow, flanked beyond stupendous gorges on either hand by a wilderness of mountains reaching everywhere to the sky-line, rising in great steps along an untrodden way to an untouched peak, — that is what the final

climb in the capture of Balfour meant for us. It tried tact, agility, and care, but was not difficult or dangerous. By the time we had built our cairn and taken bearings with the prismatic compass, it was four o'clock. Little chance to keep our engagement with Nichols to meet at six by Turquoise. Indeed, it was seven before he saw us over the brow of the glacier, and then working in and out among its crevasses like cautious ants; and full eight o'clock when, on the rock-rim overlooking Margaret, he took us by the hand and congratulated us man by man on the day's success. Hardly had we carefully worked down the rounds of the dizzy rock-ladder before darkness was upon us; but we stumbled on in our "persistence" to the edge of the wood, made a fire, put out at dawn by chunks of snow from a bank hard by, when, at the first faint light, we could make a start for the dear old camp by the firs and pools and streams of the Bow. Soon as a hasty breakfast and packing would allow, we plunged into that inferno of travel through the long black blow-down, that with a diabolical ingenuity strives to prohibit access from the railway to the enchanted region of lakes and peaks. Before we reached Laggan, at seven o'clock, after fifty hours, full forty of which we had been on our feet moving, it seemed a misery to justify profanity if not suicide; but in memory it fades, like all discomforts, to a faint line of shade on the brightness of those fifteen brilliant days of perfect weather, health, enjoyment, exercise, and adventure, the like of which, I believe, no other mountain region can afford the climber.

The Making of Abbot Pass.

BY REST F. CURTIS.

Read November 9, 1898. ●

THE Chalet at Lake Louise is the natural base of operations for mountain-lovers in the Canadian Rockies, and its charming surroundings are becoming familiar to increasing numbers by photograph and sketch, as well as by happy experience. A preliminary morning's walk early in our trip of last summer

had revealed to me for the first time the lower portion of the great glacier which starts on Lefroy and Victoria, and which feeds Lake Louise. Later on, however, it was our good fortune to make our exit from this valley, not by the beaten road, but by an ascent of the glacier throughout its length, a crossing of the now well-known Abbot Pass, the first in its history, and a descent on the Pacific side, a day's excursion in which rock-work and glissading, lakelet, stream, and woods figured each at its best, and blended into one of the most exquisite wholes that either of us have ever had the fortune to enjoy.

The preliminary trip referred to was taken partly to photograph a curious rock which could be seen with the naked eye from the Chalet, three miles away, projecting boldly from the side of the ice near the foot of the glacier. It was imbedded in a steep ice-wall and cast a long shadow, also noticeable from afar. Just one week later, early on the day of our making Abbot Pass, we were again at this spot, and the photograph taken on this day shows the rock lying at the base of the slope and its empty case above. The impressive suggestion of the two views is that this rock had been taken by the ice from the cliffs of Mt. Victoria at some time in the distant past, had been held in its embrace for all these years, perhaps centuries, had at length emerged to the surface of the ice, and had finally parted company with its envelope, as the result of a storm between our two visits of a week apart. Stretches of space are not the only ones which a day among the high mountains may reveal.

Our climb up to Abbot Pass was familiar ground to my companion, but had long been a cherished object of desire to me. For an hour or two after leaving the lake, we followed up the swift glacial stream, crossing and recrossing it as the imaginary path suggested. Then the water became sub-glacial, and we were for an hour on the hard ice. This we found covered with crevasses, but of the open-hearted kind which tell you at once frankly all the harm that they are capable of doing you, and distinctly invite you to avoid it. Sometimes long detours were necessary, to find a spot where the lips of the chasm were not too far parted, and then the trusted rope enabled us to make the jump with light heart as well as light foot, knowing that

a slip would mean at worst the chagrin of having to be hauled up a few feet by the other two of the party. But soon our standing-ground was changed from ice to the snows of recent winters, which, though covering the ice beneath, had not yet been translated into the more solid state. Packed firmly, this makes excellent footing; but as the heat of the day increased, one sank deeper and worked harder for each step. Then, too, the slope grew steeper, and it became necessary to make constant zigzags on our upward course—congealed tacks, as it were. But now we are far enough up the pass to make our downward glances at the steeps already accomplished serve only as an inspiration for the steeper ones to come. We are in the narrow part of the ascent. The crags of Lefroy and of Victoria are closing in upon us. We balance ourselves with our axes on the snow-slope long enough to let the massiveness of these crags and their grim contrast with the beautiful ice and snow and sky sink into our vision with a glowing impressiveness that will pack away into memories for the future, as the snow under our feet is being packed into the glacier of years to come. On the right, the melting snows from far up on Victoria are sending down tenuous streams of water, which, breaking into spray against the cliffs, form for us exquisite rainbows. On the left rises a steep ridge of snow up which we are making a long though necessary slant, and over which we finally make our way on to the more easy slope which leads us to the summit of the pass.

Four to five hours had brought us from the lake to the summit of the pass, the time differing but slightly from that of the parties of the year before.

The view from here, though of course less extensive than that from either of the mountains bordering the pass, was still superb, and was enhanced by the clearest of skies and of atmosphere; but the chief interest to me lay in a careful survey of all the detailed features of Mt. Lefroy. To one who had followed closely, soon after its occurrence, the accounts of the attempt of 1896, as well as the successful ascent of 1897, it was a source of no slight enjoyment to have all the localities laid out in detail, with accurate explanations by one of the participants.

A good lunch, moistened with snow-water, helped to prepare us for a perfect afternoon. A glance down the broad, stony couloir through which we were to descend made one hesitate at first, and indeed it was so steep that great care had to be exercised to keep each one out of the line of descent of falling stones which were necessarily dislodged by those who were above. As a welcome relief from this strain came a chance, gladly accepted, of a long glissade down a not too steep snow slope, and then — the beautiful Lake Oesa, which we had been watching nestling in the rocks and ice far below us. We were now down far enough to get a view of one of the finest amphitheatres which the Rocky Mountains have as yet made known to their visitors. We were indeed within it, and here at the base of the rear wall of Mt. Victoria, so familiar in its other aspect, lay this gem of a glacial lake. We knew that Lake O'Hara, larger and better known, lay below, but we were surprised to find that the two were but the extremities of a chain of delicious sheets or dots of water down part which we found our way growing gradually easier. At the last of these smaller lakes we stopped long enough to remark with surprise that the crags and rock fragments rising high above it on all sides gave it no outlet, and for a time we lost the stream we were following. We were on the lookout, however, and as we came out upon a bench overlooking Lake O'Hara, a backward glance showed us a stream, or rather a broad band of several streams, coming out of a cliff some hundreds of feet below its upper margin, and combining in a vertical waterfall, to descend to the level of the lower lake. It was really a startling sight, as though the rod of some modern Moses had been at work, but we recognized it as our old friend, the stream, which must have found its way down between the strata of the rock beyond the light of day and suddenly reappeared, not in the loose stones, but out between strata of the bed rock itself.

Aside from our interest in the cascade, the view from this point was of such surpassing beauty as to cause us considerable delay, and to tempt us to much more. Perched upon a crag just above timber line, we reviewed our course down from the pass, and called up all the delights of the hidden slope on the other side. The massive western wall of the great Continental



ABBOT PASS, LOOKING SOUTHWEST.

From a Photograph by H. C. Parker.



ABBOT PASS FROM ABOVE OESA LAKE.

From a Photograph by C. E. Fay.

Divide towered above us, as did also rock peaks of no mean height further to the south. From their snows came a second stream furnishing its quota to the supply of Lake O'Hara. We were still, perhaps, a thousand feet above its surface, and in a position to view it to the best advantage. Nestled in the forest as in a velvet frame, it reflected the blue and gold of sky and sun in a brilliant combination. Around the graceful curves ran a broad fringe of delicate red and brown of the shallow border, setting off both water and forest in most pleasing contrast. Though arising from different causes, this was not unlike in color and effect the beautiful fringes of the lakes and pools in the geyser region of the Yellowstone Park. But all this was to be seen on our way down, and we less reluctantly hastened on. We were soon in the timber and aiming for the lake, but as we came to the edge of a bluff overlooking it from a nearer point, we found ourselves driven far to the right of our expected line. A graceful bay in the water-line below, small in itself, was enlarged in its projection on the mountain-side at our altitude into a sweep of great proportions, far too nearly vertical, however, for any direct descent, and thus requiring a long and tedious detour. This little trick was repeated more than once again, and caused us to think of our lake almost as a mirage, so unexpectedly long a pull did we find it down to that level. Once beside it, we would fain have lingered by its enchanting shores, but day was waning. The last film of the larger camera, saved for this especial spot, was used. A hair-raising but deliciously invigorating plunge in the icy waters of the lake refreshed us both, but was steadfastly refused by our lively youth "Jim," who had served as our third on the rope for this trip, a mere wetting of the bare feet being quite enough for him. We were off at seven to follow the stream out to an unknown distance, afterwards found to be about eight miles, to the tracks of the Canadian Pacific Railway. The remnants of the so-called "O'Hara" trail were at times misleading, but more often invisible, and as the woods were growing thicker and the daylight fainter, our progress was less rapid. Fallen timber soon became a prominent element of obstruction, and called for even more gymnastic agility than it received. Jim proved himself apt at this, and also as a scout, saving us some steps by discovering where the trail was not.

We pushed on, however, into the edge of the darkness, increasingly doubtful of covering the undetermined distance out that night.

The stream remained an interesting feature of our course. In general we kept close to it, though at times its steep banks would drive us on to their upper margin. Several times we thought the faint trail would lead us across it, but it was now of such a width and force of current as to render a bridge of some sort a necessity. Finally a fallen tree spanning the torrent seemed a distinct suggestion that it here passed to the other side. Jim, an adept at such feats, ran across like a squirrel, and my companion, with some misgivings, followed him over the roaring waters. It seemed the part of prudence for me to wait until the necessity of the somewhat ticklish performance was proved. As the search for the trail on the other side was fruitless, I found myself on the right side of the stream by simple force of inertia. In the increased darkness the return over the rude bridge created some justifiable qualms in my companion, and indeed a fall into the rushing waters would probably have carried one speedily beyond the reach of help. So the help was extended beforehand, and our Alpine rope was made to perform an unaccustomed function. Knotted around his waist in approved fashion, the other end came to my firm grasp on the hither shore, and I had visions of a sure catch in case that I was destined to become a "fisher of men." But nothing worse than leg-wetting occurred, and we soon found it desirable to repair this slight damage and to settle ourselves down for a night in the woods. It was not the first in our experiences together, and was by no means an uncomfortable one. In the bottom of a little dell, a miniature amphitheatre, we built our cheerful fire on damp moss, and on the surrounding slopes, kindly cushioned with the same upholstery in a dry state, we found such repose as our day's exercise called for and our temperaments permitted. It may be noted, however, that while Jim slept the sleep of the just and the young, his employers got the wood and piled it on the fire. To him the whole day had been an experience of an entirely new kind, and we think we discovered in him the raw material of an excellent guide. At daylight we pursued our downward way, in general along the course of the stream, yet

at times, when the valley widened at some distance from it, skirting along the slopes. This stream, as we had followed it from its source near Lake Oesa, may be considered as the upper ten or twelve miles of the beautiful Wapta River, which the Canadian Pacific Railway follows from Hector Pass to the Columbia, with its wild scenery in gorge and canyon. All the rougher features of a Canadian mountain forest were presented to us in abundance in our morning "ramble," and as two or three hours of hard scrambling and swamp-wading were necessary to bring us out to the railroad, we felt justified in having refused our "guide's" constant suggestion of the previous evening, to "push it through that night anyhow." We reached Hector Station in time for the morning train, which soon brought us to the hospitable inn at Field. Here a late breakfast and a leisure day soon overcame the fatigues of a most varied and vigorous trip.

Lost River.

BY FRANK O. CARPENTER.

Read June 8, 1898.

AMONG the many delightful experiences of a mountain climber which linger longest in his memory are the walks and climbs beside the mountain brooks. Sometimes sliding noiselessly over the moss-covered rocks high up in some steep and tangled ravine, sometimes falling in graceful cascades or foamy waterfalls over dark ledges, either complaining or chattering over their stony ways, or loitering in cool, shady corners where the trout love to stay, they are always refreshing and delightful to the sight, and dear and grateful to the memory. Tantalizing are they too, sometimes, when, stopping to rest a moment during a hot, hard scramble up a steep mountain ridge, one hears far off in the ravine below the rush and roar of the brooklet, the course of which is marked by the light, fresh green of the trees which grow beside it, drinking the cool water one longs for so much. Most welcome are those same brooklets, which sing so loudly, when a climber, lost or delayed

in some pathless forest tangle till the sun has set, comes upon them, for he knows that he has a safe guide that will lead him past many a turn and bend, through many a dense thicket perhaps, but surely at last to the cleared fields of the farms and the shining lights of home.

One of the most beautiful of the White Mountain brooks is the Moosilauke Branch, which rises high up on the slopes of the mountain of that name, and after a winding course of eight or nine miles flows into the Pemigewasset River at North Woodstock. The rock scenery along its course is unrivaled. Nowhere else are there such curious and varied specimens of pot-holes and erosion. It would seem as if the brook delighted to show its skill. Further down the stream you come upon a series of narrow pits and basins of perfect outline; then the famous Agassiz Basin, that enormous pot-hole, holds you wondering at the mighty force and countless years needed to chisel it, and, last of all, a few rods above its junction with the Pemigewasset, the brook has carved the curious and unique ridges called "the Mummies." This brook and its beauty have long been known to the mountaineer and fisherman, but until a year or so ago it kept one of its treasures, its best, the so-called "Lost River," hidden in a tangled ravine miles away from the farms and roads.

"Lost River" is the name given to a deep gorge where the water of the brook disappears from sight, and at times from sound, for a considerable distance under massive boulders. It is the third great natural wonder in the Franconia Mountains, standing next after the Profile and Flume, far surpassing the latter in its surprises, its massive rock architecture, and unique in its dark, gloomy caverns. The gorge itself is about one-half mile long, twenty to thirty rods wide, and forty to seventy-five feet deep to the brook bed. It was discovered in 1895, by Mr. R. C. Jackman, of North Woodstock. It has not as yet been made passable for any but the strongest climbers with cool heads and strong muscles. Visitors should take candles or a lantern, and a strong fifty-foot rope, if ladies are in the party, or if a descent into all the chasms is intended. The fact that it requires three hours of almost continual exertion to traverse the half mile of gorge and see its principal points of interest,

shows its unusual character and the labor required to visit it. I have myself visited "Lost River" many times, and have made five careful explorations of it, the most thorough one being made in company with Mr. W. S. C. Russell, of Manchester, Mass. At each visit I become more and more charmed with the beauty and grandeur of its gorge, and impressed by its mighty rock carvings. It is with especial pleasure that I take this opportunity to report to the Club some of the details of this newly discovered natural wonder.

The path to "Lost River" starts at the Lawton farm,¹ three miles from North Woodstock, one mile west of Agassiz Basin. It begins in the field beyond the house on the left, crosses a brook at the edge of the woods, then runs for two miles over a delightful forest-shaded path with easy grades, and in forty minutes reaches a broad, shallow stream, the Moosilauke Brook. There is no bridge, so the brook must be crossed on stones, or forded, if the water is high. Beyond the brook the path rises gradually by easy grades. Ten minutes from the stream it enters an old, abandoned carriage road to Easton. Three more large and several tiny brooks are crossed. The third large brook is reached in forty minutes from the Moosilauke. The path ascends rapidly, and in fifteen to twenty minutes reaches a rather level stretch, with a sign "Lost River" on the right. The sign is small, wood colored, and easily missed. A side path from this point leads in about five minutes to the upper end of the Lost River gorge, — four miles from the Lawton farm, seven miles from North Woodstock. Visitors should ride, if possible, to and from the Lawton farm, as the tramp is sufficiently fatiguing even for strong climbers, without the extra three miles of road each way.

It is unwise for inexperienced persons to visit the gorge without a guide, as the way is puzzling and there are many chances for serious or fatal falls into deep caverns. There are at present only a few people fairly acquainted with the gorge: R. C. Jackman, its discoverer, Franklin P. Clark, the only thoroughly trained guide to the Franconia Mountains, E. E. Woodbury, and Wilbur L. E. Hunt, who may be obtained as guides, if at

¹ One quarter mile west of Agassiz Basin the road forks. Take the right fork, which ends in three quarters of a mile at the Lawton farm.

leisure. These all live in North Woodstock. Mr. W. S. C. Russell and myself, who best know the gorge, are both of us at North Woodstock in the summer, and are always glad to give information to intending visitors.

Where the path reaches the brook at the head of the gorge, the water flows lazily and almost without a ripple over a ledge into a depression twenty feet deep, and disappears in a small hole under a large boulder. No hint is given of the wonders below as you look at this from a distance, but if you climb down to the small hole you find the water has made a leap into a dark cave. In low water one could at much risk go through this hole by taking a drop of ten feet. By climbing to the top of the high bank on the left, where a slight trail shows, and sliding down several slopes too steep to walk, by the aid of roots and saplings, under great rocks, where a ladder is needed, you make

"A turn and you stand in the heart of things,
With the rocks heaped round you vast and dim,"

in a spacious entrance hall, the "Hall of the Ships."¹

In front of you rises a massive boulder, the "Sentinel," twenty feet high, rounded like the stern of a vessel. Beside it another rock resembles the prow of a warship. A dark pool of water about their bases makes the resemblance complete. From this hall you enter a dim cave, into which the brook leaps from above and at once disappears, flowing through a small "shadow cave" so dark that a light is needed. The floor of the "Hall of the Ships" is thirty to forty feet below the brook level at the head of the gorge.

Climbing from this hall up the steep slopes you slid down and around the "Sentinel," the top of which is covered with an exquisite growth of moss, from which springs a graceful little fir-tree, you descend a short ladder and find yourself under the "Guillotine" with its block beneath. So striking is the

¹ In describing the gorge many names have been used, subject to possible changes; but the explorers intend to save this beautiful gorge from the hackneyed scriptural and devil names, such as Devil's Den, Devil's Pot-hole, Lion's Den, Pulpit, etc., which appear with tiresome and meaningless repetition in all similar places. The name "Hall" has been given to a space between the boulders open to the sky; "Cave" to one shut in and roofed over. Many interesting nooks are still unnamed.

resemblance of the great knife-edge of rock hanging in the air that the name springs naturally to one's mind. Behind this the brook has worn a curious twisted channel seventy-five feet long in the rock, quite impressive when after a rain the water rushes through it. Near by, another rock hanging in air suggests a "Trip Hammer" ready to drop.

Beyond the "Sentinel" another great boulder on end, the "Watch Tower," keeps guard over the way, with dark chasms below that make you cautious. I have not the exact measurements of these pits, but they are quite deep, and certainly look rather "uncanny," as a friend called them who refused to climb into them with me.

Next you pass to the right around a sharp corner, along a narrow ledge not more than eighteen inches wide, "The Edge of the Sword," where, as on the Mohammedan Al-Sirat, the good (that is, the cool-headed) pass on in safety, while the bad (that is, the dizzy-headed) will fall to the jagged rocks below. Once more you slide and scramble down dark winding passages to "Pluto's Judgment Hall," a large cavern, weird and shadowy, 70 feet long by 40 wide, 15 to 20 feet high, its floor covered with water except a little sandy island. A pointed rock, the "Altar," juts above the water in the centre of the hall. In the farther corner, showing white and ghost-like, the river leaps down the "Falls of Proserpine" with a gloomy roar, calling in vain for the old gods and shades who have vanished. Near at hand is the "Cave of the Shades," which cannot be safely descended except by roping the party together — a most exhilarating five minutes of real mountain climbing.

Beyond you come out into an open hall and the sunshine, beside a great mossy crag climbing the side of the ravine, dainty with ferns and small trees, the "Queen's Bower." The river appears for a moment, catches the sunshine, and leaps into the "Dungeon," a most perfect, circular pot-hole. A few rods beyond on the right is a regular shaped grotto, the "King's Chamber," containing a rock resembling a bed and pillow. Beyond this, by a narrow and dangerous sloping shelf not more than two feet wide, where a rope should be placed, you reach a level and smooth shelf, passing like a gallery around the right side of a deep basin with lofty sides, the "Hall of Lethe" (where one

is forgotten). You leap a deep chasm, where a rope is needed, and then follow the sunny river a dozen rods over delightful mossy rocks through the Elysian Land. Then down again many feet you climb to a large cave with a high roof, — the "Centre of the Earth," weird and impressive in the dim light, with dark chambers opening from it, where lights are needed. By the outer entrance is a pretty little pot-hole, the "Cup of Water."

Beyond, on the right, the descent is made to the sandy floor of the "Giant's Pot-hole," the largest in the mountains. A boulder, seemingly ready to fall, is poised on its top forty feet above your head, and warns one to keep under the slanting side of the rock. The view of the gorge from the "Pinnacle" opposite is very fine.

Once more you go down to the "Cave of Silence," where the river is so far below that even the sound of its murmur is lost, and you sit in complete silence under thousands of tons of mighty boulders. On the right is a small dark cave, and on the left you enter the "Cave of Lost Souls," one of the most impressive in the gorge. From the outer cave a seemingly shallow pocket, where you have to crawl, leads to a large chamber totally dark.

Very impressive and solemn are these dark, damp, icy caverns, where your breath shows white as on frosty winter days, though the sun may blaze thirty feet above, and the smoke from your torch or lantern floats slowly away in strange shapes like wraiths of lost souls.

Beyond, the river appears, flows quietly a few rods in still, deep pools, and then leaps gayly down, "shattering in sunshine over its ledges" the beautiful cascade of "Paradise Falls," thirty feet to a basin with impassable sides at the foot of a lofty boulder, the "Guardian."

One cannot descend by the falls, but must climb up the steep shoulder on the left and descend by a narrow path at the left of the cascade, a passage requiring great caution. It is better, in all cases, to climb further up the ravine on the left side and away from the river, and descend to the side of the falls by easier and safer grades, around great boulders, any one of which on a plain would be called enormous. The finest view

of the falls themselves is from the top of the "Guardian" rock, reached by a narrow path on the side furthest from them. Below the "Guardian" is a pretty pool with an oval basin filled with clear water, the "Dryad's Bath."

A few rods down stream is the "Titan's Workshop," the most wonderful example of rock architecture in the gorge. Two mighty slabs of stone, one forming the roof of the cave, and the other, its mate, standing almost on edge, as true in surface as if cut with a chisel, remain just as the Titans might have left them when they built the earth ages ago. Just below on the left is a most exquisite little hall, the "Vestal's Chamber," with a rock table in the centre, the top covered with moss.

For a number of rods the stream flows on through great rocks and deep pools, gradually growing shallower, ending with one which mirrors most perfectly the graceful foliage about it, the basin of "Au Revoir." Then the brook goes to playing in the sunshine, loitering over the pebbles and along the sandy shores as if tired of masquerading as a "Lost River" among the giant boulders of the gorge, and as if resting awhile before it takes up its mighty task of carving Agassiz Basin, two leagues away.

Leave the brook at this point on the right bank at right angles to the stream. The Lost River path is about thirty rods away through the woods. Thence a walk of an hour and a half will bring one to the Lawton Farm.¹

It has not been possible in the limits of this paper to more than give a list of the principal features of the gorge without dwelling on their special points of interest, but above all one is impressed with the mighty rocks and boulders, the forces which split them from their parent ledges and hurled them pell-mell into this narrow ravine, and the countless ages since that the brook has moulded and rounded them. Nowhere else but in King's Ravine in Randolph can be found anything like it, and the King's Ravine boulders are no larger than these, if as large. Over all the sides of the gorge and on the boulders, above the freshet water line, grow beautiful mosses in exquisite shades of green, gray, and brown, waving with dainty ferns,

¹ Take care not to miss the path where it leaves the old logging road. The path is the left fork, and is plainer and more direct. The road bends away to the right (south).

safe from vandal hands so far, as was the Flume until the great slide in 1883 washed its hanging boulder and mosses away. And so the "Lost River"¹ awaits you with its beauty and its wonders, its strange contrasts of great boulders, their heads in the warm sunshine, gay with ferns and flowers, their feet in the chilly caves where no sunlight has penetrated for thousands of years, and when you have once had the fortune to visit this rugged ravine and see with your own eyes and feel its charm and its mystery, I believe that thereafter very often it will —

"Uplift against the blue walls of the sky
Its mighty shapes, and let the sunshine weave
Rare golden network in its belting woods,
Smile down in rainbows from its falling floods,
Loom vast in dreams, and stretch in billowy length
From the sea-levels of your lowland homes."

Geology of the Adirondack Region.

By C. H. SMYTH, JR.

Read July 7, 1898.

THE Adirondack region consists essentially of pre-Cambrian crystalline rocks, bounded on all sides by the later rocks of Paleozoic time. The geological history of the region is, therefore, recorded in obscure characters, for the interpretation of such crystalline rocks is everywhere attended with the utmost difficulty.

In the Adirondacks, this interpretation has been little more than begun, the detailed work thus far done being quite limited in comparison with the large area to be covered; and it follows that our knowledge of the region is far from complete. However, through the efforts of the State Geological Survey, and more recently of the United States Geological Survey, enough has been accomplished within the last decade to enable us to present with confidence some of the broader facts of Adirondack geology.

¹ A more detailed description of Lost River is given (pp. 66-70) in the guide book, *The Franconia Notch and Pemigewasset Valley*, written by the author, and published by Alexander Moore, Boston, 1898.

By far the most widespread rocks of the region are gneisses, which, though showing much variation, are most commonly of gray or pink color, medium grain, and so massive that, in the hand specimen, the gneissic structure is scarcely evident, though nearly always shown in outcrops. When studied under the microscope, these gneisses are found to consist, as a rule, of the micro-perthitic intergrowth of orthoclase and plagioclase feldspars, hornblende, and varying amounts of quartz, pyroxene, mica, magnetite, apatite, zircon, etc. Granulation of the constituents may be conspicuous, or, again, quite obscured by recrystallization.

These gneisses are metamorphic rocks, and have been modified under great pressures at considerable depth in the earth's crust; but as to their origin, and relations to other formations, much remains to be learned. From studies in the western Adirondacks,¹ it is certain that some of the gneisses are of igneous origin, — granites, syenites, gabbros, etc., which have been modified by metamorphism; while others are, with equal certainty, altered sediments. But by far the larger part of the gneisses have as yet received no careful study, and constitute the major problem of Adirondack geology awaiting solution.

With reference to their distribution, it may be said that the gneisses occur in nearly all parts of the region, but are most abundant in the western half, where they form nearly uninterrupted areas hundreds of square miles in extent.

A second formation which is quite widespread, but occurs in much more limited areas, consists of coarse-grained crystalline limestone, with intimately associated hornblende and pyroxene schists. These rocks are greatly folded and crushed, and are further affected by various intrusive rocks; but, in spite of their resultant highly crystalline character, they are to be regarded with the utmost confidence as of sedimentary origin. This formation is found in small, isolated patches, scattered through the eastern and central parts of the region, and forms belts of considerable extent in St. Lawrence and Lewis counties.

¹ C. H. Smyth, Jr., Report on the Crystalline Rocks of St. Lawrence County: Fifteenth Annual Report of the State Geologist, 1895, pp. 482-497.

—Report on the Crystalline Rocks of the Western Adirondack Region: Seventeenth Annual Report of the State Geologist, 1897, unpublished.

From what has been said above, it will be clear that the relative ages of the gneisses and the crystalline limestone are involved in doubt; but some parts of the gneiss are certainly younger than the limestone, and this may be true of all.

A third important formation is seen in the great intrusions of gabbro which break through both gneisses and limestone, and constitute the most striking feature in the geology of the eastern Adirondacks. Two varieties of gabbro occur, of slightly different age.¹ The older, usually distinguished as anorthosite, consists almost wholly of labradorite, with accessory pyroxene, hypersthene, magnetite, etc. It is extremely coarse-grained, cleavage faces of the feldspar the size of one's hand occurring in the normal rock. Pressure effects are pronounced, a cataclastic structure appearing frequently, while, in extreme cases, the rock is crushed so thoroughly that it becomes a rather fine-grained gneiss, difficult to distinguish from some members of the gneiss formation proper.

This anorthosite is the prevailing rock in Essex County, stretching over into Clinton and Franklin counties. Mt. Marcy and its neighbors are made up of it, and stand near the centre of a large area within which there is little else. The visitor to the Au Sable Lakes, from the time he leaves Elizabethtown until his return, will be for the most part in the anorthosite area, and, aside from the closely-related more basic gabbro, will see hardly any other rock *in situ*, unless it be a minor patch of the crystalline limestone or the gneiss. In passing, however, from Lake Placid to Au Sable, one crosses a broad band of gneiss between Au Sable Forks and Keeseville.

The younger gabbro differs from the anorthosite in containing abundant pyroxene, and other ferro-magnesian silicates, and is also finer-grained. It forms much smaller areas, and breaks through the anorthosite in irregular bosses and sheets. Like the latter rock, it is often highly metamorphosed, passing over

¹ J. F. Kemp, Preliminary Report on the Geology of Essex County: Thirteenth Annual Report of the State Geologist, 1893, pp. 433-470.

—Gabbros on the Western Shore of Lake Champlain: Bull. Geol. Soc. Am., V. pp. 213-224.

—Crystalline Limestones, Opicalcites, and Associated Schists of the Eastern Adirondacks: Bull. Geol. Soc. Am., VI. pp. 241-262.

into obscure hornblende gneisses, whose relations to the unchanged rock are often difficult to make out.

Somewhat similar basic gabbros occur in the western Adirondacks, but the anorthosite is absent. In its stead, acid rocks, such as granite and syenite, occur, breaking through the crystalline limestone, and, by the resultant contact, metamorphism, giving rise to many of the mineral localities for which St. Lawrence, Jefferson, and Lewis counties are famous.¹

It should be clearly understood that all of these igneous rocks — gabbros, granites, syenites, etc. — are of the plutonic type. That is, they were not poured out upon the surface as lava flows, but were forced into the older limestones, etc., at great depth, and, solidifying slowly under a heavy cover, took on the compact and completely crystalline structure necessarily resulting from such conditions. While it is entirely possible, even probable, that portions of these magmas found their way to the surface and were ejected from volcanoes, we have no record to show that such was the case.

After the solidification of the igneous rocks, they were subjected, while still at great depth, to the processes of dynamic metamorphism, and the structural features referred to above were developed.

This was followed by another period of igneous activity, evidenced by the numerous dikes which intersect all of the rocks thus far described, and which themselves show no effects of metamorphism.² Indeed, there is reason to believe that there were two of these periods of minor igneous activity, one pre-Cambrian and another post-Ordovician. The intrusions of the former period extended as far as the St. Lawrence River, but those of the latter were confined to the neighborhood of Lake Champlain.³

¹ C. H. Smyth, Jr., *Crystalline Limestones and Associated Rocks of the Northwestern Adirondack Region*: Bull. Geol. Soc. Am., VI. pp. 263-284. — *Genetic Relations of Certain Minerals of Northern New York*: Trans. N. Y. Acad. Sci., XV. pp. 260-270.

² J. F. Kemp and V. F. Marsters, *The Trap Dikes of the Lake Champlain Region*: Bull. 107, U. S. G. S.

³ H. P. Cushing, *On the Existence of Pre-Cambrian and Post-Ordovician Trap Dikes in the Adirondacks*: Trans. N. Y. Acad. Sci., XV. pp. 248-252.

With the pre-Cambrian dike intrusions, constructive action in the Adirondacks ceased for a long time. A period of profound erosion followed, laying bare the rocks, which had been formed, or metamorphosed, or both, as the case might be, at great depths in the earth's crust. Of the length of time involved in this period we have no knowledge, but it must have been very great, as erosion is a slow process, while the results produced were vast.

The entire Adirondack region seems to have remained a land area until the beginning of upper Cambrian time, when marine conditions supervened in the marginal portions, resulting in the deposition of the Potsdam sandstone upon the uneven surface left by the erosion of the older rocks, an unconformity of large magnitude being thus produced. The Potsdam is shown at Elizabethtown, but on a much larger scale at Au Sable Chasm, of which it forms the walls.

The presence of scattered outliers of Potsdam and later rocks some distance back in the mountains indicates that the sea was not strictly confined to the margin of the region. It is possible that the topography in Potsdam time was somewhat similar to that of the present, and that these Potsdam outliers were deposited in arms of the sea extending up into drowned valleys.¹ The character of the Potsdam (a sandstone with frequent conglomerates) is such as to point to the proximity of a land area at the time of its deposition. Thus it might be concluded that, during upper Cambrian time, the Adirondack region formed a rugged island, rather smaller than the present area of crystalline rocks, and with a very irregular coast line. On the other hand, it is also possible that the region was reduced to low relief by pre-Cambrian denudation, and that the Potsdam outliers have been faulted into their present position. The facts now at hand do not warrant the final acceptance of either of these hypotheses.

More or less interrupted but on the whole progressive sinking followed, with the deposition of the Calceiferous, Chazy, Trenton, and Utica rocks. With the exception of a few outliers, these rocks are confined to the margins of the region, rest-

¹ J. F. Kemp, *Physiography of the Eastern Adirondacks in the Cambrian and Ordovician Periods* : Bull. Geol. Soc. Am., VIII. pp. 408-412.

ing sometimes upon Potsdam and sometimes, by overlap, directly upon the crystallines.

If we conclude from the character of the Potsdam rocks that they were deposited near a coast line, there seems equal reason for accepting the converse with reference to some of the later rocks, and particularly the Trenton. This great limestone formation suggests clear, open seas, with little land sediment; and its presence around the crystallines, together with the outliers and the extensive overlap on the west, indicates a considerable submergence of the Adirondack region. How long this lasted we do not know, as there are no rocks later than Utica in the record; but it is possible that there was no great reëlevation until the close of the Silurian, or perhaps even later.¹

The next important event in the history of the region (the post-Ordovician dike intrusions having already been mentioned) was the production of an extensive series of faults, which involve both the crystalline and the overlying Paleozoic rocks.² These faults are numerous, and to them are due many of the bold cliffs and "passes" so frequent in the mountains.³

By the post-Ordovician elevation, the Paleozoic sediments were exposed to the attack of denuding agents, whose action was at the same time intensified over such portions of the region as may have escaped submergence. Denudation, continuing to the present time, has stripped off an unmeasured thickness of Paleozoic sediments, and cut down anew into the underlying crystallines.

This process was more or less interrupted and modified by the glacial epoch, when the ice rounded, scored, and polished the mountains and ridges, perhaps deepened and widened some of the valleys, and dumped immense quantities of detritus in such an irregular way as to greatly impede drainage through the old-established channels.

This old drainage system had been greatly influenced in its

¹ C. D. Walcott, Cambrian Faunas of North America: Bull. 30, U. S. G. S., p. 24, and fig. 2, p. 25.

² H. P. Cushing, Faults of Chazy Township, Clinton County, N. Y.: Bull. Geol. Soc. Am., pp. 285-296.

³ J. F. Kemp, Preliminary Report on the Geology of Essex County: Thirteenth Ann. Rep. State Geologist, 1893, pp. 433-470.

formation by the nature of the rocks. Its pronounced northeast-southwest trend corresponds with the prevailing strike of the rock structures, while the valleys usually follow the outcrops of soft formations when present, particularly the limestones; the mountains and ridges consisting chiefly of the harder gneiss, gabbro, granite, etc. The glacial detritus dumped in the old valleys has in many cases served to pond back the water, and thus form the numerous lakes which add so much to the present charm of the region. By the subsequent deposition of sediment, both inorganic and organic, many of the lakes have been reduced in size, while others have been completely destroyed, being converted into the natural meadows or "vlaies" so frequent all through the woods, and second only to the lakes in beauty.

Much might be added in regard to the geographic features of the region, but the field is so large that it should form the theme of a separate paper.

ECONOMIC GEOLOGY.

A word may be said as to the economic geology of the region. Magnetic iron-ore deposits of great size occur in the gneiss, and have been worked on a large scale for many years. The chief mines are at Mineville and Hammondville, but there are many other localities of importance. The origin of the ores is very obscure, but they may in some cases be contact products where gabbro cuts the gneiss.¹

Immense bodies of titaniferous magnetite occur in the anorthosite, and years ago they were worked at Adirondack. But the titanium interferes with the smelting, and the ore is of no present importance, though it probably will be worked in the future, as purer deposits become exhausted. These titaniferous magnetites are ultra-basic portions of the gabbro which have segregated in the molten magma by a process not clearly understood.²

¹ J. F. Kemp, *The Geology of the Magnetites near Port Henry, N. Y.*: Trans. Am. Inst. Min. Eng., XXVII. pp. 146-203.

²—Gabbros on the Western Shore of Lake Champlain: Bull. Geol. Soc. Am., V. pp. 213-224.

—Preliminary Report on the Geology of Essex County: Fifteenth Annual

In the crystalline limestone areas of St. Lawrence and Jefferson counties, hematite was once mined on a large scale, but the mines have been idle for some years. The ore is probably a replacement of the limestone by iron derived from decomposing pyritiferous schists.¹

One of the belts of limestone in St. Lawrence County carries beds of nearly pure fibrous talc, which is being mined at the rate of about fifty thousand tons per year. It is largely used in the manufacture of paper, and is of a quality hardly equalled in any other locality.²

Certain hornblende gneisses and amphibolites in Warren County are rich in garnet, which sometimes forms nearly pure masses of several thousands of pounds' weight. This garnet is mined in some quantity and used as an abrasive material.³

The region is particularly rich in building-stones. Large quarries in St. Lawrence County turn out a marble of great beauty and durability; while the Potsdam sandstone is hardly excelled in either of these respects by any stone in the market, though rather difficult to work.⁴ The anorthosite has been quarried somewhat for building purposes, as has also, for rough work, the gneiss in the western part of the region. The granites have as yet been little worked; but as they exist in great variety and beauty, and in almost unlimited quantity, we can hardly doubt their use in the future.

Report of State Geologist, 1895, pp. 575-614 (continued from Thirteenth Annual Report, 1893).

¹ C. H. Smyth, Jr., Report on the General and Economic Geology of Four Townships in St. Lawrence and Jefferson Counties, N. Y.: Thirteenth Annual Report of State Geologist, 1893, pp. 493-515.

² C. H. Smyth, Jr., Genesis of the Talc Deposits of St. Lawrence County, N. Y.: School of Mines Quarterly, XVII. pp. 333-341.

—Report on the Talc Industry of St. Lawrence County: Fifteenth Annual Report of State Geologist, 1895, pp. 661-671.

³ F. C. Hooper, Garnet as an Abrasive Material: School of Mines Quarterly, XVI. pp. 124-127.

—The American Garnet Industry: Mineral Industry, VI. pp. 20-22.

⁴ J. C. Smock, Building-stone in the State of New York: Bull. N. Y. State Museum, No. 3, 1888, pp. 42-44 and 45-51.

Notes on the New England Upland about the White Mountains.

By PHILIP EMERSON.

MY youthful conception of the surface of New England was of a hilly region, with a continuous mountain chain at the west, and at the centre a similar one, perhaps less continuous and more complicated. Travel made this statement of the case unsatisfactory, but never replaced it with another as simple yet fundamentally true. Having at last met and grasped the idea of the possible formation of a peneplain, and that New England might be such a surface again raised and cut by valleys, my eyes were alert with new interest on my next summer's mountain tour. Whether the theory were true or not, it certainly made clear the surface facts of southern New England, — rolling uplands or upland remnants, with occasional monadocks, and valleys broad or narrow. Definite facts regarding the upland in northern New England seemed lacking in the records.

It may be well, before passing to its application, to briefly state the theory of aerial planation as related to New England.

Exposed to the weather, rocks decompose and disintegrate; and, though parts of the continents are at times slowly upraised by internal forces, they are as surely worn down toward sea level, until, in the longest ages of comparative quiet, a cycle of land life may have been nearly completed. In its youth a plain would be cut by stream valleys, whose ramifying tributaries would secure an everywhere sloping, graded surface at maturity, with a maximum intensity and variety of relief. With a quiescent land, the long period of old age would see weathering and erosion reduce even the interstream hills, until the rivers meandered lazily over a gently rolling plain toward the sea. Likewise a lofty mountain region of folded rock-layers would not alone be cut by valleys into sharp and lofty peaks, but, as uplift ceased, the peaks would sink with rounded tops, and slopes too gentle for the avalanches of young mountains; and as ages passed away they, too, like the interstream hills, might be conquered by weather and water, and reduced to a

surface of so gentle relief as to seem almost a plain, that is, a peneplain. The rocks of such a land would be hard, not coastal deposits, — inclined at all angles, not in the level layers of a typical plateau.

The New England upland is such an old mountain region of disordered crystalline rocks, planed off so as to give the uniformly even sky-lines one sees at the upland level. The present valleys show that the peneplain has been raised to an upland, giving the streams renewed power. Near the coast, the valleys are shallow and numerous, cutting the upland into hills; to the west and north they are deep, and broad upland areas remain. Narrow valleys like the Deerfield or lower Connecticut are cut in hard rocks; broader lowlands, like that of the Connecticut from Greenfield to New Haven, or those about Boston and Narragansett Bay, are developed on areas of relatively weak rocks. Some rocks were too resistant to be brought to the general level of the peneplain, and still rise above it in the White and Green Mountains, or in single peaks like Mount Monadnock, whence all such peaks are called monadnocks. These surface divisions of upland, mountain, and valley closely affect the distribution of population and occupations. The monadnocks preserve Nature's forests and wild creatures, and serve as vacation resorts for the Appalachian Club and their friends. Man first settled the lowlands, as when the Dorchester church struggled across the upland to the Connecticut, and there population and life still remain in large and busy cities, while roads and railways thread the narrower valleys connecting manufacturing cities and towns. The upland, infertile and out-of-the-way, is characterized to-day by decaying villages and deserted farms.

Climbing the Sandwich Hills beside my bicycle, with this theory in mind, and looking down on South Tamworth and Moultonboro, I noted a narrow strait of level land separating the Ossipee Mountains from the heights to the north. At once came the suggestion that this was perhaps a portion of the upland country, but low-lying clouds prevented confirmation at the time. Northward through the Glen Ellis and Dixville notches all was mountain and valley, as seen from the roads. Rising from the Connecticut valley into Canada, we seemed in a

few miles to reach the upland surface, and there the eye looked away for many miles over the rolling surface to where a line of monadnocks near Lake Memphremagog, and another group far northward toward the St. Lawrence, broke the nearly even skyline. Here the upland seemed as well developed as in the south, and the bicycle rolled easily over its stretches, past farm and hamlet, in striking contrast to the steep slopes encountered at intervals of ten or fifteen miles, where the road descended to some railroad town or city in a valley. Later in the trip, returning from the Adirondacks across the Hudson valley, I turned from Bennington, Vt., eastward, and, approaching the upland, again climbed its steep western slope to Woodford City. Here, at what was called the summit of the mountain, I found myself really on the edge of the upland plateau, in a typical upland village, — a "city" hardly able to support a church or store. Eastward the wheel ran freely for several miles, until, approaching the Deerfield, it seemed to fairly drop down the steep road into a side valley; and so eastward the sharp contrasts of upland and valley continued.

Two summers spent about Fryeburg, Maine, wheeling over the upland, and looking down upon it from the mountain summits, have made clear some facts regarding it there. Standing on the isolated monadnock, Mount Pleasant, to the east and northeast the eye sweeps over the almost unbroken upland surface to the far-away glitter of Casco Bay, and the still more distant blue monadnock groups that just break the horizon to the northeast. Northwestward the upland meets the mountain walls of the White Mountain group of monadnocks in what seems almost a straight line, slightly oblique to the New Hampshire boundary, which it cuts. The contrast of monadnock and upland makes the latter seem in very truth a plain, instead of a rolling, rather uneven surface, as it actually is; and just as clearly shows the upland to be an important surface fact as does the contrast of upland and valley in Massachusetts. Extending eastward from the White Mountain region, both on the north and south, are seen irregular and lower groups of monadnocks, limiting the continuity of the upland in these directions.

When first travelling from Portland mountainward, I was

impressed by the fact that the Saco flood-plains were practically continuous with the upland; and further observation seems to still relate the broader intervalles of the mountains to the upland level. The Saco flows southward through the Conways, then, turning a mountain shoulder northward, it meanders around the long Fryeburg loop and across Brownfield, until farther eastward it drops into an old gorge or preglacial valley in the upland and courses seaward. The two portions of the Fryeburg loop seem in places to be separated only by the sand terraces built at the close of the glacial invasion; and a short canal at one place has diverted the river water, and caused it to abandon many miles of its former course around the bend. Many acres at North Fryeburg have thus been saved to valuable tillage from too frequent flooding. The northward portion of the loop shows that the river is wearing away its flood-plain, leaving typical terraces and ox-bow lakelets, and falls over ledges revealed in the process. The southward portion seems to be still upbuilding, having high river-banks and back swamps to the north, and in Brownfield extensive meadows that are normally slightly flooded.

Where the flood-plain is still upbuilding, it has at several points dammed side streams or border areas of the main valley, forming extensive lakes, whose water-level rises and falls with the river freshets. In springtime the outlet of Kezar Pond becomes an inlet, and the turbid river-floods, setting strongly back into the lake, deposit their silt as they meet its quiet waters. Thus the outlet flows down the centre of a long, low peninsula, which extends beneath the waters still farther into the lake, and is really a typical delta in form and growth. Opposite the two channels that enter the outlet—distributaries of the delta—are stranded tree-trunks, swept into the lake with the inflow from the river. Thus on one river, within one township, the two phases of flood-plain life are well shown, a narrower stretch of valley with steep side-slopes connecting the two. Where the flood-plain is in its old age, there are villages on the upper terrace, and fertile fields and meadows on the lower; where it is still in its youth, the scattered houses are on the old land of the valley sides, and life on the flood-plain is so precarious that in wet years the grass lies ungathered

and other crops are drowned. The terrace deposit seems to mark the limit of the extensive deposit of sands swept from the mountains at the close of glacial times, — deposits so abundant as to dam side outlets to the east, and cause the stream to meander northward over the upland for a time. The facts do not seem to be related to post-glacial tilting, as they are the opposite of what a rise of the land to the north would effect.

From the western summits of the Ossipee Mountain group, one looks across the many low islands that dot Lake Winnepesaukee, and far over the upland that stretches southeastward from the lake, to the characteristic lines of Mount Monadnock on the horizon. Since, from the Saco intervalles, the valley roads cross a hardly noticeable divide into the Ossipee country of Tamworth, this view seems to roughly connect the well-known upland of southern New England with that which stretches eastward in Maine from the White Mountains. I have not stood on Chocorua for some years, but the view thence should show the upland both to the southwest and northeast. Standing on the west shore of Squam Lake, a stretch of horizon between Red Hill and distant Chocorua is broken by no mountain outline; that is, Red Hill is an isolated monadnock, and Squam lies on the upland. Many views across these large New Hampshire lakes, and over them from above, suggest that they are practically at the upland level, which is represented in their low islands and often low shores. Since these districts were nearly surrounded by monadnocks, it was possible for glacial dams to cause the extensive drowning of valleys over a large area.

Returning from the mountains by wheel this summer, I left the upland about Lake Squam and travelled westward. The region about Plymouth seems to consist entirely of monadnocks, the only suggestion of the upland level being the valleys buried in glacial sands, as along the Pemigewasset, or flooded with water, as at Newfound Lake. Scattered farms lie along the hillside wanderings of the roads, and pastures extend even to the summit of Mount Prospect; but life is really confined to the valleys, where railroads run and villages gather. Pushing my wheel up the steep slopes and over the divide north of Mount Cardigain, I noticed many deserted homesteads, and

fields given over to pasturage, and pastures growing up to bush and forest, though rarely there was some young couple striving to reclaim a farm. Climbing Cardigain, I looked eagerly through the August haze for trace of the upland. Northward all was a mass of monadnocks, rising toward the Franconia Mountains and the peaks of the East Branch region; so also eastward, until the eye guessed at the gleam of Winnepeaukee through the smoky air. Across the Connecticut the hill lines of Vermont were suggested; but about the mountain to south and southwest certainly appeared the upland, in clear contrast to the mountain slopes, and reaching up between the many monadnock groups in bays and gulfs. The appearance of villages and a better occupied farming country was evidence of the same also. Cardigain stands like Chocorua as a leader at the front of the mountain army, looking out to where the advance guard of isolated groups and peaks spread out on the upland. Ascending the southern Kearsarge the next day, though the haze hid Cardigain and barely revealed Monadnock, it was seen that upland and mountain now fairly divided the field; and, nearing Monadnock the following morning, the upland seemed everywhere, and the mountain peaks rose only occasionally above it. Though I turned eastward, thought still travelled south to where Wachusett stood alone above the rolling upland areas, the last tall sentinel of the array of granite peaks to the north that have so long and well withstood the attacks of the weather.

In conclusion, the fact of the upland seems strikingly brought out in its contrast with the mountain slopes; its extent is somewhat readily traced with the eye as one becomes familiar with the mountain borders; and the dependent life relations are evident, as in the distribution of population and occupations. Peaks like the northern Kearsarge, Chocorua, and Cardigain mark the limit of monadnock country that is unbroken save by valleys; other peaks, like Mount Pleasant, Red Hill, and the Ossipee Mountains, are isolated monadnocks close to the main mass. Eastward from the White Mountains, the open sea of the upland country comes right to the monadnock shore, with hardly an outlying island; southward the upland is covered for miles by an archipelago of monadnock groups and peaks. The

terrace flood-plains of many larger streams seem approximately at the upland level where they leave the mountains, and in the case of the Saco the stream wanders about on the upland before it drops into a definite valley seaward. Portions of the upland nearly enclosed by monadnock groups have been easily dammed by glacial debris and broadly laked.

Bibliography.

THE ANNALS OF MONT BLANC, A MONOGRAPH. By CHARLES EDWARD MATHEWS, sometime President of the Alpine Club. London: T. Fisher Unwin. 1898. With a map and illustrations. 8°.

"The Annals of Mont Blanc" is a history of this mountain peak, and in no sense a record of personal achievements. It is true that the author, Mr. Mathews, a former president of the Alpine Club, has made no less than twelve ascents, and could have produced a very interesting volume from his own experiences, but such was not his intention. There did not exist in our language any consecutive, comprehensive history of the mountain, although fragments of this story are scattered throughout our literature, in the musty volumes of scientific proceedings, in out-of-date issues of magazines, and in forgotten files of newspapers. For several years Mr. Mathews has been seeking out these articles and items, and his book is the result of his labors, and one of the most valuable contributions to the literature of mountains that our own or any other language possesses.

The volume is unassuming in its style, and peculiarly interesting from its plain setting forth of the facts. It begins with the legendary Mont Blanc, "the accursed peak," it was called, which was situated in a land teeming with dragons. Then there comes a natural clearing away of the mists of tradition and the earlier visits to the district by reliable authors and scientific investigators. The mighty glaciers of the Alps were an attraction to the learned, while the natural mountain-climbing instinct in man led to repeated efforts to scale the icy slopes. A number of attempts are of record previous to that successful one which, in August, 1786, placed Balmat and Piccard on the top of the highest summit in the Alps.

From this time forward to the ascent of Albert Smith in 1851, the individual ascents receive considerable attention in this volume, but early in the fifties it became almost a fashion to climb to the summit of Mont Blanc, and numerous mountaineers, singly and in groups, were successful in gaining the summit. As an aside to the main issue in the volume, there is given an interesting account of the formation of the Alpine Club in 1857, an event which led to a better knowledge of the mountains and to the seeking out of new paths whereby to ascend it. As one of the original members of the Club, the reminiscences of Mr. Mathews are of especial interest.

There is of course the less pleasant portion of the story of a mountain in the disasters which have befallen the adventurous mountaineers who have sought to climb it, and the history sets forth a list of these with care and minuteness. An exceedingly important feature of the volume is its bibliography, which has been carefully prepared, while a chapter on the geology has been written by no less an authority than Professor T. G. Bonney.

Within the covers of the book is included a reproduction of one of the early treatises on the glaciers of Savoy, that which was given by Colonel William Windham in a letter to Arlaud of Geneva, a painter, and one received by him from Martel, an engineer of the same city.

The book is an attractive one in every way; the lightness of its paper makes it convenient to hold in the hand, its topography is faultless, and its illustrations are excellent.

J. R. J.

THE GEOGRAPHICAL JOURNAL. Vol. xiii., No. iv. April, 1899.

The last issue of this authoritative Journal contains, among others, two articles of unusual interest: Professor J. N. Collie's story of his two explorations in the Canadian Rockies in the summers of 1897 and 1898; and a paper on "The Sources of the Saskatchewan," by Mr. Walter D. Wilcox. To those who have followed in APPALACHIA and elsewhere the history of the development of this region as a field for mountaineering, these articles will furnish much that is instructive and interesting. They serve to broaden considerably the restricted geographical field to which attention has hitherto been confined; yet one of the most striking facts to be noted in them is, that the earlier scientific visitors to this region (1857-1860) penetrated well towards the limit reached by the most recent parties. Those who read Dr. Collie's account of his trip with Mr. G. P. Baker and Sarbach in the season of 1898 will remember that a striking peak was described in the north from the highest point attained by them on Mount Freshfield, and that their great interest was excited to know whether it might not possibly be the Mount Brown or Hooker which, for two or three generations, have been spooking on all maps as the highest of the Rocky Mountains. A myth dies hard. Seeing this colossus in the north, the idea was suggested that Professor Coleman, who reported adversely as to the existence of such high peaks in the vicinity of the Committee's Punch Bowl as the result of his expedition in 1893 (see APPALACHIA, Vol. VII., p. 332), might, perhaps, not have found his way to the same pass as that visited by Douglas, the botanist, by whom these mountains were named. It was this lure that brought Dr. Collie back in 1898 with Messrs. Wooley and Stutfield. In an excursion of between five and six weeks, they advanced over Pipestone Pass and *via* the valleys of the Siffleur, the North Fork of the Saskatchewan, and an eastern branch of the Athabasca River to a point about 52° 21'. Their progress was greatly impeded by the unusually swollen streams of last season, and to these delays is doubtless due the fact that the ascent of none of the grander peaks seen by the party was attempted. From their camp in Wilcox Pass, on the divide between Saskatchewan and Athabasca waters, Messrs. Collie and Wooley (while Mr. Stutfield was hunting sheep to supply their depleted larder) made the ascent of a fine rock and snow peak (11,700 feet), from which they enjoyed a remarkable view. Nearly west, and some fifteen miles away, rose "a magnificent peak that is probably nearly 14,000 feet high," which "stood alone, keeping guard over those unknown western valleys. . . . Some few miles to the northwest of this peak, and also on the opposite side of the snowfield in a northwesterly direction, the biggest peak of all was seen. Chisel-shaped at its head, covered with glaciers and ice, it also stood alone, and I at once recognized the great peak I was in search of." This latter mountain, which they found to be a long way from the proper location for Brown and Hooker, they named Mount Columbia, according to an altitude of 14,000 feet; the other they named Mount Bryce, for the President of the Alpine Club. The mountain from which these were seen they named Athabasca Peak. A snowy dome ascended later is "probably the only peak in North America the snows of which, when melted, find their way into the Pacific, the Arctic, and the Atlantic oceans; for its glaciers feed the Columbia, the Athabasca, and the Saskatchewan rivers." Another mountain, some twenty miles farther northwest, was ascended by the party, and became the limit of their journeyings, — Diadem Peak, 11,500 feet high. "From its summit we looked over into the western branch of the Athabasca, and only a few miles away the flat-topped rock-peak (Mount Alberta) rose above us more than 2000 feet. It was during the ascent of Diadem that the weather finally broke."

An interesting map accompanies the article, embracing the country from Mount Goodsir on the south to Diadem Peak, and locating the diminished Brown and Hooker. It has a special interest to members of our Club, for the plotting of the

base line was done at the Chalet at Lake Louise in the summer of 1896, by P. S. Abbot, and the first field-work towards its execution was begun a year later by Messrs. H. C. Parker and C. S. Thompson, by whom it was then turned over to Mr. G. P. Baker, who carried it forward in his later trip with Dr. Collie. The reviewer would call attention to a probable error in the height of Mount Gordon, which probably involves no others. By the careful measurements of the Dominion Topographical Survey, Mount Balfour is accorded a height of 10,845 feet. Not only the small amount of climbing found necessary by our party of 1897 in reaching the summit of the Upper Bow Lake (6200 feet), but the way in which Balfour was seen to tower above us, as well as the corroborative testimony of numerous photographs made by the D. T. S., give evidence of a far greater difference between these two peaks. We doubt if Mount Gordon surpasses 10,000 feet.

The comments of Messrs. Baker, Stutfield, and Conway called out in the session of the Royal Geographical Society, at which Dr. Collie's paper was read, and appended thereto in the *Journal*, are comforting reading to those who for some years have appreciated and celebrated this grand region. Mr. Stutfield speaks of "splendid mountains and magnificent scenery, new Alps, and a new Switzerland larger than the old one, and scarcely inferior in the beauty of the mountains and the varied charms of lake, forest, and river scenery;" and Sir Martin Conway, after setting forth the individual beauties of several mountain regions, remarks: "But in all this variety of beauty of mountain scenery there are no mountains which combine grace and at the same time boldness of form with forest and with water more beautifully, as far as I can judge, than these mountains Mr. Collie so well described." Mr. Baker took occasion to put on record the excellent pioneer work done in the '80's by T. E. Wilson of Banff. The reviewer begs to thank Mr. Stutfield for his use of the phrase "the Canadian Alps," and would urge its employment as a generic name to include the Canadian Rockies and the Selkirk.

It is fitting that the same issue of the *Journal* should contain Mr. Wilcox's story of his visits to the same region in 1896 and 1898. We are sorry not to give more space to this interesting article by one of the most energetic pioneers in Canadian mountain exploration. The subject is also discussed by him in the "*National Geographic Magazine*" for April, 1899, and hence is readily accessible. Dr. Collie's party advanced but one or two days' journey, perhaps twenty miles, beyond Mr. Wilcox's farthest north. Both his article and Dr. Collie's are illustrated by half-tones from their photographs.

C. E. F.

SIERRA CLUB BULLETIN. Vol. ii., No. 5. San Francisco, January, 1899.

This issue of the *Bulletin* presents a series of four very interesting papers, three of which describe recent explorations in the High Sierra, while the fourth, "The Taking of Mount Balfour," by Mr. C. S. Thompson, presents a portion of the expedition described by Mr. Noyes in this issue of APPALACHIA.

Professor J. N. Le Conte opens the number with an account of an extended trip through the upper San Joaquin country for the purpose of running "a rough line of triangulation between the highest peaks from Mount Ritter and Mount Whitney," — an air-line distance of about ninety miles. A sketch map, locating fifteen important stations, is published in this same number; and it appears that a revised map in three sheets, presenting what is known of this, probably the most remarkable mountain region within the United States, is in contemplation. Mr. Le Conte's article gives a vivid description of the several ascents made by himself and his companions. Of special interest is his account of their unsuccessful attempt on the formidable peak of Mount Humphreys, whose upper portion is "a solitary pinnacle of rock rising 3000 feet above a wide, desolate plain." The sensational character of this stupendous scenery is suggested in Mr. Le Conte's report of his impressions at the highest point reached: "If it had only been possible to bring away a photograph, — a suggestion of that wonderful sight, that spur of granite over 500 feet high, not 200 feet wide where we stood, and whose sides continued on 1000 feet below! I have never felt

so impressed, so utterly overpowered, by the presence of a great mountain, as when standing among the crags of Mount Humphreys, looking up that smooth wall to the airy summit, and again down 10,000 feet into the depths of Owen's Valley." Professor C. B. Bradley describes a visit to a region still farther south. He entered it by King's Canyon and over the King's and Kern Divide, and stopped for eleven days to explore the peaks about the various branches of Bubb's Creek, particularly the great amphitheatre at the head of its eastern arm. Five lofty peaks were climbed, of which three were virgin ascents. An exquisite half-tone of Bullfrog Lake, with the peaks overlooking it, gives a clear idea of the peculiar beauty and grandeur of the region. A sketch map accompanies this article also. An ascent of Mount Whitney completed the work of the party. Speaking of the granite of the region, Mr. Bradley says: "The topmost layer of all, as seen on the summit of Mount Whitney, is a fine, massive, enduring rock, split indeed into immense boulders, but not crumbling into sand. And it is doubtless to this enduring quality of the rock that Mount Whitney owes its preëminence" as the highest peak of the United States south of Alaska. Mr. Lincoln Hutchinson calls attention by word and illustration to "A Neglected Region of the Sierra" lying north of the Yosemite. The route of his party was from Sonora to the summit of Sonora Pass, thence up the east fork of Relief Creek to Kennedy's Lake and over the main divide to the headwaters of Watkins River, then southward to the head of Fall River. The writer considers this almost unknown region one of the finest in the Sierra.

C. E. F.

ZEITSCHRIFT DES DEUTSCHEN UND OESTERREICHISCHEN ALPENVEREINS. Jahrgang 1898. Band XXIX.

The twenty-ninth volume of this annual maintains its high standard of excellence. A glance at the titles of the eighteen special articles that make up the present number to nearly four hundred imperial octavo pages reveals a notable variety in character and a wide geographic field. The scientific papers are of especial interest for us, and embrace the following: "Torrential Floods" (Muren), by Professor F. Friek, who was appointed in 1892 to make a geological study of the problem, especially in the Brenner district, in behalf of the D. und Oe. A. [The chief results are, briefly stated: (1) the beneficent value of these floods in prehistoric time in preparing the conditions for man's coming; (2) that the water is less a source of damage than the masses of rock débris transported; (3) that the retentive capacity of good forest is inadequate in excessive rains; (4) that anchoring of the drift deposit is the basis of regulation; and (5) that a geological survey must furnish data for this basis of procedure]; "The Life Story of Alpine Plants," by F. Pax; "The Maltreatment of Forests in Alpine Districts," by A. von Guttenberg,—a discussion of evils not yet found among us, and applying to wood-lots held by small proprietors: such are the wholesale removal of branches for cattle-bedding, the destruction of young trees by grazing, and by burning over tracts for raising crops among the trees, the robbing of trees of their resin, and, incidentally, excessive lumbering; "The Calculation of the Range of Visibility," by F. Ramsauer. This interesting paper is by all means the most thorough treatment we have seen of this subject, of practical value to all who ascend to lofty view-points. The author discusses it under various aspects: (1) the geometric calculation of the limit of visibility, giving, beside the formulæ, a table for heights of from 100 to 20,000 metres, with the corresponding angles of depression for the horizon, followed by a list of some 120 peaks in all parts of the world; among these we find Blanca Peak (4408 m.), with a "Schweite" of 237.2 kilometres (137 miles): here, too, figures Mount Hooker, the myth, calculated from its usually accorded height: St. Elias, with its 5950 m. of altitude, gazes 171 miles over arctic wastes; (2) the increased value, about 8 per cent., resulting from refraction; (3) the relation of the elevation of the surrounding country, illustrated by a number of special problems; and (4) the determination of the amount of the earth's spherical surface embraced, also illustrated by two tables. Some interesting facts are deduced from these; as, for instance, that an express

train moving 35 miles an hour would require 21½ hours to encircle, were it possible, the horizon visible from Atna; that Long's Peak overlooks a "calotte" of only 772 square miles, two thirds of what it would view but for the height of its base above the sea. (This area would, by the way, probably be considerably reduced on account of the high ranges in its western semicircle.) The author modestly claims only an *approximate summary* for a large part of the work, owing to uncertainty as to details.

The "kulturbistorisch" interest is represented in two articles, "The Eastern Alps during the Napoleonic Wars," by H. von Zwiedeneck-Südenhorst, continued from the last number, and an extended paper by R. von Strele on "Bell-ringing and gun-firing in Thunder Storms."

(Of the articles of a purely geographic and alpine character beyond the domain of the Alps, see one by A. Penck on "The Illicilliwaet Glacier," the fullest presentation yet made of the retreat of this Selkirk ice-stream, illustrated by two eloquent photographs showing its front, taken by Notman nine years apart (1888 and 1897); and a generally told story, by W. R. Rickmers, of a persistent effort made by him in late October, 1895, to reach the virgin southern peak of Ushba, the twinned giant of the Caucasus. Three attempts were made, and each time a height of 4000 m. was reached, 750 m. short of the desired summit. The article closes with the philosophical and comfortable remark: "When a mountain says, 'Thus far and no farther,' have in mind that you have to return, and that he who returns safe and sound is victor of that fact with a victory.")

The articles dealing with the Swiss and Tyrolean Alps are noteworthy for their exhaustive character; they contain matter for special volumes. Such are Dr. A. Kähler's paper on "The Tannheimer Valley" (39 pages); that by F. Benesch, on "The Karawitz and Wiener Schneeberg" (33 pp.); George Geyer's, on "The Main Chain of the Central Alps" (47 pp.); H. Seyffert's, on "The Southern Marmolata Group" (54 pp.); H. Krenner Mayr's "Rosengarten Group" (35 pp.); and F. Kordon's, on the separate mass of "The Hafner Group" (34 pp.); 22 full-page illustrations, 89 smaller views, 4 maps in the text, 1 large map of the Rosengarten region and a panorama of the eastern portion of the Hafner group from a drawing by Compton (the two last issued as "beilagen") furnish the rich, nay luxurious, illustrative material of this remarkable periodical.

C. E. F.

REVUE DU CENTRE EXCURSIONISTA DE CATALUNYA. Barcelona.

Among the foreign exchanges in our Library is an interesting file of the "Buttletti del Centre Excursionista de Catalunya." As the title indicates, this publication is the organ of an association of Catalanophiles, who are asserting the nationality of Catalonia, and claiming for their local speech the right of sisterhood with the Romance languages. Like the parallel manifestation in Provence, the Catalan renaissance started as a literary movement, but with this disadvantage: that, while Provençal is an infinitely better medium for poetry than French, Catalan is in melody decidedly inferior to Spanish. In 1876 a new direction was given to the movement by the organization of an Association for Scientific Excursions, the first of its kind in Catalonia. The present Centre is the heir of that parent club, though whether as a re-organization or as an offshoot we cannot say, since our file dates back only to May, 1897. The Centre Excursionista organizes excursions to adjacent regions, and publishes full accounts of these expeditions; but it cannot properly be termed an alpine or even a mountain club. Its scope is best explained by the following extract from the Constitution:—

"The object of the Centre is to explore the different sections of Catalonia for the purpose of studying and preserving all that seems noteworthy both in regard to the natural features, history, art, and literature, and the language, customs, and traditions of its inhabitants."

The districts of Catalonia are rich in material for one and all of these branches of study. The Club's work is carried on enthusiastically, and the results are made public through the Buttletti and separate publications, and by lectures. What is per-

haps the most interesting portion of last year's work is recorded in a series of articles by Font y Sague on certain speleological researches undertaken by him in the region north of Barcelona. Following the methods of Martel, he visited a large number of caves, taking accurate measurements, and blasting when necessary for the purposes of exploration. Besides the scientific value of these records, a benefit to agriculture resulted in some cases, as when he discovered and stopped a subterranean leak which was impoverishing an important rural water-supply. The articles are illustrated by the writer's own photographs, and by diagrams showing the course and siphonage system of underground streams draining or supplying the mountain springs.

The Centre announces for the present year five public lecture courses on scientific subjects, and on the history, language, and literature of Catalonia. Specially prominent among these is a course on photogrammetry, to be given by the President. Great pains are taken to encourage topographical observations and the preparation of maps. In a similar line of effort is the prize of five hundred pesetas offered last year for the best geography of Catalonia.

Whether the original aim, the reinstatement of a distinct nationality and language, will ever be realized we may question; but in any case the Centre is accomplishing a great work of public education in a field where the laborers are few.

M. R. C.

IL BIELLESE. Milan, 1898.

The meeting of the thirtieth Congress of the Italian Alpine Club in the city of Biella was made the occasion, by the section of the Club there located, of publishing an exquisite volume setting forth the various attractions and interests of the region of Northern Italy of which that city is the commercial centre. It is an imperial quarto of 330 pages, not counting the numerous inserts. The extraordinary number and beauty of its illustrations captivate the eye, already favorably disposed by the elegant and tasteful outward appearance of the volume. Indeed, the quality of a most refined taste is characteristic of the entire work. The illustrations are more than 400 in number, of which nearly a score are full-page photogravures, while half-tones, full-page and of every lesser size and shape, fairly swarm throughout the book. The series is appropriately opened with a superb double-page half-tone of Biella itself, with its fine mountain background, ideally presented from an aquarelle by E. T. Compton, whose artistic pencil is in demand for the finest illustrative work of European alpine literature. The subjects are of the greatest variety: views within the city, in the workshop, in the field, the vineyard, the high alpine pasture; by the brookside, in the ravine, on the lofty mountain top; the hotel, the water-cure, the convent, the church; the peasants' repast at sunny noon-tide; the "carovana scolastica," with its ropeful of schoolboys being shown the deep mysteries of the yawning crevasse; the luxuriant vine, the exquisite bunch of anemones on the steep cliff: flowers of every sort, human and inanimate, furnish subjects for this wealth of pictorial material. Perhaps the most striking scene is a photogravure of Monte Rosa at dawn, taken from a summit near Biella.

The variety in the text of the work is suggested by these illustrations. The articles are in prose and poetry, — biographical, scientific, social, and industrial, as well as topographical and scenic. Distinguished names are found in the list of contributors, names familiar this side the ocean: Schiaparelli, the astronomer; De Amicis, the littérateur, and others well known to readers of Italian alpine literature. Schiaparelli himself is a native of Biella. Quintino Sella, the founder of the Italian Alpine Club, and more distinguished still as the financial savior of united Italy, was a Biellese, and the profound veneration in which his name is held is attested on many a page in text and illustration. It is no slight pleasure to be able to see here the portraits of these men who have increased the glory of Italy. The camera of Vittorio Sella, and the pen of other members of this distinguished family, have contributed to the beauty and value of this work. In "naming names," that of E. Gallo must be especially spoken for his remarkable photographic work; also that of D. Vallino.

No brief review can do justice to a book which must be seen and studied to be fully appreciated. We can only remark that the production of so elaborate and costly a work by a comparatively small society bears witness to a devotion and enterprise of the highest order.

C. E. F.

DEB DANSKE TURISTFÖRENINGES AARSSKRIFT. Copenhagen, 1899.

This periodical represents a movement quite prevalent in the Scandinavian countries, one combining appreciation of the beauties of their native land with the practical effort to render them known and desirable, as well as accessible, to foreigners. This society numbers 1495 members, counting those in its affiliated sections in different Danish towns. The *Aarskrift* (Annual) is a book of 215 pages, about a quarter of which is given up to matter such as furnishes our own Register. The first special paper is the discussion of a scheme of railway coöperation in excursion traffic, covering a large territory from Rome and Madrid to Stockholm and Trondhjem, by H. Bagger, the vice-president of the society. Five brief illustrated papers present the attractions of as many districts in Denmark, and upon these follows the second installment, some 68 pages, of an exhaustive and very fully illustrated article on tourist routes in Iceland, by D. Brunn, from which it is obvious that Iceland is a country that would well repay the tourist and mountaineer for the long journey and a protracted stay.

C. E. F.

BIBLIOGRAPHICAL NOTES.

The "Revue Alpine" of the Lyonnaise Section of the Club Alpin Français is an important monthly which devotes itself to matters of local and Swiss alpinism. It presents not only valuable essays on topography and the mountains, interesting accounts of ascents and other descriptive matters, but also carries along from month to month a "chronique alpine," the minutes of the meetings of the many sections of the French Alpine Club, and a bibliography of great value. As might be expected, the meetings and excursions of the Section Lyonnaise are fully represented. The "Revue Alpine" is well illustrated, and is one of the most important publications in its class.

The Section du Sud-Ouest of the Club Alpin Français issued in 1898 its bulletins Nos. 43 and 44. The former contains an interesting account of a trip into the Basque Provinces by M. E. Durègne, a region which, so far as topography is concerned, has been little explored. No. 44 presents an account of the Congress of the Club Alpin Français at Barcelonnette, a short study of the porphyries and basalts of Scotland by M. Durègne, while Comte Henri Russell writes of his thirtieth ascent of Vignemale.

"L'Echo des Alpes," the publication of the Sections Romandes of the Swiss Alpine Club, has now completed its thirty-fourth year. Its monthly issues are devoted to the Alps and the news about them. The present year it has passed in detailed review the group of mountains about the Muthorn and Silveretta, the article bearing the signature of M. Henry Cuénot, while a novelty is described in an exciting night ascent of the Matterhorn. The magazine testifies to the activity of the group of sections of the parent Club which unite in publishing it.

"In Alto," the chronicle of the Società Alpina Friulana, now in its ninth year, gives attention to a very interesting section of the Alps. The Society, which includes in its list of members more than three hundred names, is exceedingly active in the exploration of its own district in the Alps, and "In Alto" has much to say about the topography, geology, and botany of this district. It does not limit its work to the neighboring mountains, however, for early in the volume for 1898 Signor G. Marinelli brings together much information concerning the height of *Ætna*, making the summit 3274 metres above sea level, and the floor of the crater 3112 metres in altitude. The activity of the Société de Spéléologie has stimulated this

Italian society, and it has an active section which is devoted to the exploration of caves.

Among the newcomers into the publication of "proceedings" may be noted the Club Alpino Bassanese, which last year issued its third annual *Bollettino*. This is a neatly printed octavo devoted to the topography, geology, and natural history of that district in northern Italy of which Bassano is a centre. Much attention is paid in the publications to the very interesting folk-lore of the country.

The "*Revue Géographique Internationale*," of Paris, in its monthly issues presents most completely the condition of geographical research the world over. The magazine is fully up to the times, as may be judged from the fact that it has a "*Bulletin Photographique*" and a "*Bulletin Vélodipédique*" in each number, together with a "*Chronique Alpine*" and a bibliography of value. In the later issues of the year, not a little attention has been paid to recent studies in folk-lore.

The tenth volume of the *Bulletin* of the Société Neuchâtelaise de Géographie devotes itself to the country of the Ba-Ronga, lying along Delagoa Bay on the eastern coast of Africa, between 25° and 28° south latitude, a little below Madagascar. The author, M. Henri A. Junod, has here presented a critical consideration of the manners and customs of the people, their industries, amusements, traditions, and religious ceremonies and superstitions. So detailed is the story that the methods of life are discussed even to the military tactics of the warriors, their amusements, even to the singing games of the children about a cricket or a "*coleoptère*," while many pages are devoted to the folk-lore, the stories being given in the original as well as in French. The memoir is well illustrated.

The Société de Spéléologie of Paris is one of the most active of French scientific societies, having created a new department of research, the exploration of caves. It had its origin in M. Martel's splendid work, and its example has been inspiring to other societies. Speleology is now one of the lines of investigation which have many and devoted followers. The Société de Spéléologie issues two publications, "*Spelunca*," a magazine, and a series of "*Memoires*." The former cares for current topics, and, since it is issued every month, it is in the lead in point of presentation of news from the underground world. The memoirs contain longer essays of standard value by the most prominent of the world's cave-explorers. The third volume of this series of publications contains "*Les Grottes de la Vallée Bourne*," by M. Décombaz; "*Les Pyrénées Souterraines*," by M. Armand Viré; and "*Sources et Pertes des Eaux en Bulgarie*," by M. H. and K. Scorpil. The second volume is devoted to "*Le Gardon et son Cañon inférieure*," by M. Félix Magaurie.

J. R., Jr.

Report of the Recording Secretary for 1898.

On January 1, 1899, the corporate membership of the Club was 1024. The losses during 1898 amounting to 79, and the accessions to 140, and three memberships having been revived, the net gain for the year was 64. The Honorary Members numbered 19, Professor James Hall having deceased. The Corresponding Members numbered 50, Professor John Muir and Prince Luigi Amadeo di Savoia having been elected and Professor Jules Marcou having deceased. There were 104 Life Members. The total membership was 1093, a net gain of 64.

There were held during the year nine regular and three special meetings, and two sessions during the field meeting, the average attendance being 160. The attendance at several meetings has been unusually large. The largest was 400, at a meeting held in Horticultural Hall in coöperation with the Massachusetts Horticultural Society. The Philippine lecture, on account of the attendance of 290, was adjourned to Huntington Hall. At four other meetings, the seating capacity of Room 11 in Rogers Building was not sufficient. A new problem is thus presented for solution. At its birth the Club was fostered by the Massachusetts Institute of Technology, and for twenty-three years we have enjoyed the privilege of meeting in its lecture rooms. The expense has been nominal; if we go elsewhere, rentals will diminish the funds available for other purposes. Our associations with the Institute have been too valuable to be broken. Neither should the meetings be made less popular. For certain lectures an admission fee might be charged, a larger hall being hired; this, however, would be an unpleasant innovation. In the solution of the problem the Council will welcome suggestions from members.

At the various meetings there were presented, besides reports of officers and committees, twenty-one papers, twelve of which were illustrated with the lantern. There were also seven accounts of trips made during the winter excursion. Canada had five papers besides an evening with "The Wild Flowers of the Canadian Rockies," a superbly illustrated lecture. The White Mountains afforded papers for three meetings and the Adirondacks for two. Our own Mount Grace was the subject of one paper, and Jamaica, Capri, Tyrol, India, and the Philippines completed the list.

The field meeting at St. Hubert's Inn, Adirondack Mountains, from July 1 to 9, with after trips to Lake Placid and Ausable Chasm, was one of the largest field meetings ever held, and many of the party enjoyed the experience of spending a night in the attractive camps on the Upper Ausable Lake. There was also a small but successful camp on Lake Winnebaukee in August. Accounts of these and other excursions will be found in the report of the Excursion Committee.

The Snow-shoe Section held its annual meeting in January.

The snow-shoeing near Boston was unusually good, and two meets were held, which were largely attended and much enjoyed. The excursion was to Waterville, N. H., February 19 to 28, and was attended by 34 men and 17 women, all of whom enjoyed the snow-shoeing in spite of phenomenally bad weather. All were members of the Club, or have become such during the year. The membership of the section is now 133.

The Field Study Section has ceased to exist, and the balance in its treasury, about \$40.00, has been used in purchasing a quartered oak table for the rooms of the Club. The table has been placed in the centre of the larger room upon a handsome rug, which has been generously donated by the President.

The Alpine Section has been very active the past season. The membership, seven, has remained small, owing to the limited number of Appalachian Mountain Club members who have had experience with rope and ice-axe. Four of the seven members were in the Canadian Rockies last summer, and a full account of their explorations will be found in the report of the Councillor of Exploration.

The annual social meeting was held at the Hotel Vendome on Friday evening, February 11. The attendance was 212, and a balance of \$35.00 was turned into the treasury. Social meetings, with exhibitions of photographs, have been held at the Club rooms, and also several reunions of those attending excursions.

Attention is called to the reports of the various Councillors. Again the Sella photographs have been exhibited at the gallery of the Boston Art Club, and now they are being exhibited by an association of New England libraries. The blue prints of the map of the northern slopes of Madison, Adams, and Jefferson have had a good sale, largely through the interest of Mr. Chase at the Ravine House. A new camp has been built in Carter Notch and the path has been relocated. The work of exploration in the Canadian Rockies includes the naming of a new peak for the President of the Club, — Mount Niles.

One number of APPALACHIA was published, Vol. VIII, No. 4, in March. The guide-book, "Walks and Rides in the Country round about Boston," has had a steady sale. The first edition of 2000 copies was exhausted about December 1; a

second edition, of the same number of copies, has been struck off from the plates, and a portion of these are now being bound.

An unusual event of the year was the Fiftieth Anniversary of the American Association for the Advancement of Science. A large number of our members assisted in various ways to make the anniversary a success. The Sella photographs were exhibited, the club rooms were opened as a down-town rendezvous, many short excursions were arranged to places of interest in the suburbs, and a trip of five days to the White Mountains was successfully conducted.

The most important event of 1898 was the gift to the Trustees of Real Estate, from Miss Sarah B. Fay, of about two hundred acres of land in the towns of North Woodstock and Lincoln, New Hampshire. This is the largest and by far the most valuable tract of land the Club has yet received, and the generous gift is evidence of the high esteem in which the Club is held by the public-spirited donor. We accept the trust with a feeling of responsibility to the community, and a desire to preserve the forests and protect natural scenery. This reservation is to be known as the "Joseph Story Fay Reservation," in memory of Miss Fay's father.

Respectfully submitted,

ROSEWELL B. LAWRENCE,

Recording Secretary.

Report of the Corresponding Secretary for 1898.

THE Corresponding Secretary and Librarian is pleased to be able to report a continuance of the pleasant relations between the Club and its constantly increasing list of corresponding societies in this country and other parts of the world. The present number of such institutions is about one hundred and ten, thirteen having been added during the year. These additions are: Library of Oberlin College, Annales de Géographie, C. A. F., Section de la Côte d'Or et du Morvan, Danske Turistforening, Göteborgs Turistforening, Fédération Montagnarde Genevoise, Journal de Zermatt, Club Touristi Triestini, Club

Alpino Fiumano, Club Alpino Bassanese, Towarzystwo Ludoznawcze we Lwowie, the Tokyo Geographical Society, and the Queensland branch of the Royal Geographical Society of Australasia.

From the various societies the usual number of periodicals has been received during the year, increased a little, as might naturally be expected, and some important gaps have been filled in the series already on the shelves. Among these may be noted volumes of the *Cronica* of the Società Alpina Friulani, *Bulletin* of the Société Neuchâteloise de Géographie and that of the Société de Géographie of Paris, etc.

The accessions to the library are given in detail in the accompanying lists, an analysis of which shows that, besides exchanges, 118 volumes have been added to the library, 28 by purchase, 14 from the author or publisher, and 76 from Club members. During the year, 69 pamphlets have been received and 48 maps, 2 from the New Jersey Geological Survey, 9 from Professor Raphael Pumpelly, and the rest from the United States Geological Survey. The most important single gift during the year was that of Mrs. J. H. Thorndike, who presented to the library the two superb volumes of Freshfield and Sella's "Exploration of the Caucasus." During the year, Miss Isabel Batchelder gave to the library 37 volumes of travel, standard works of a few years past; while the Librarian himself has relieved his somewhat overburdened home library shelves by gifts amounting to 22 volumes of travel, all of them recent publications. Mr. E. E. Norton has cared for the Thoreau series, and has quietly brought to the library at different times the nine volumes completing the set. Mr. Jean Habel has contributed a specially bound separate of his article in *APPALACHIA* on the "North Fork of the Wapta," and a beautiful album of his own photographs of the peaks and passes described by him. This growth of the library is a gratifying one, the more so since the members are becoming sufficiently interested to give books without the necessity of solicitation on the part of the Librarian. The Club may well pride itself on its library, which contains many uncommon sets of publications, and is without peer in its specialty in this country.

During the year a new book-case has been added, and still

another will be necessary in a short time. A new card catalogue has been begun, which already has reached two thousand cards in number. In this work of cataloguing Miss Batchelder has given valuable voluntary aid, and she now has full care of the periodicals, which aggregate in number 1000 to 1200 entries a year.

EXCHANGES.

AMERICAN.

- Academy of Natural Sciences* (Philadelphia). — Proceedings, 1897, 3; 1898, 1, 2.
- American Geographical Society*. — Bulletin, XXIX. 4; XXX. 1-4.
- American Museum of Natural History*. — Bulletin, XI. 1.
- Boston Public Library*. — Annual Report, 1896-97; Monthly Bulletin, III.
- Boston Society of Natural History*. — Proceedings, 3 parts.
- Chicago Academy of Sciences*. — 40th Annual Report.
- Essex Institute*. — Bulletin, XXX. 1-12.
- Franklin Institute*. — Journal, 145, 146.
- Geological and Natural History Survey of Canada*. — Report, IX.
- Geological and Natural History Survey of Minnesota*. — Bulletin, 2d Series, Part II.
- Geographical Society of Philadelphia*. — Charter, By-Laws, etc.; Bulletin, II. 3.
- Journal of School Geography*. — II.
- Land and Water*. — II., III.
- Meehan's Monthly*. — VIII. 1-4.
- Metropolitan Park Commission* (Massachusetts). — Report, 1898.
- National Geographic Society*. — Magazine, VIII. 12; IX. 1-11.
- New Hampshire Historical Society*. — Manual, 1897.
- New York Botanical Garden*. — Bulletin, 3.
- Nova Scotian Institute of Science*. — Proceedings, II. 3.
- Oberlin College*. — Laboratory Bulletin, 1, 8, 9; Wilson Bulletin, 18-23.
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- Smithsonian Institution*. — Report, 1895; Bolton's List.
- Torrey Botanical Club*. — Bulletin, XXIV. 12; XXV. 1-12.
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- United States Department of Agriculture*. — Report of Commissioner of Agriculture, 1886, 1888; Report of the Secretary of Agriculture, 1889; Report of N. E. Climate and Crop Service, 1898, Jan.-Nov.; Publications Relating to Forestry.
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FOREIGN.

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- Club Alpin Français.* — Bulletin, 1897, 12; 1898, 1-11; Annuaire, XXIII., XXIV. Section des Alpes Maritimes: Bulletin, XVIII. Section d'Auvergne: Congrès de 1896. Section de la Côte d'Or et du Morvan: Bulletin, 1890-1897. Section Lyonnaise: Revue Alpine, IV. 1-12.
- Club Alpino Bassanese.* — Annuali, I.-III.; Museo di Bassano; Map of Bassano.
- Club Alpino Fumano.* — Annuarii, I.-II.; Attività Sociale, 1894, 1895; Statuto.
- Club Alpino Italiano.* — Rivista, XVI. 12; XVII. 1-11; Bollettino, XXXI. 64. Sezione di Roma: Catalogo del Biblioteca.
- Club Alpin Suisse.* — Jahrbuch, XXXIII. and Beilagen; Alpina, VI. 1-12. Sections Romandes: L'Echo des Alpes, 1897, 12; 1898, 1-11.
- Club Alpino Siciliano.* — Sicula, III. 1-3.
- Club Touristi Triestini.* — Il Tourista, I.-V.; Statuto; Majorca.
- Danske Turistforening.* — Aarskrift, I.-III.
- Deutscher und Oesterreichischer Alpenverein.* — Mittheilungen, 1897, 18, 23-24; 1898, 1-22; Zeitschrift, 1897.
- Federation Montagnarde Genevoise.* — Bulletin, II.
- Göteborgs Turistforening.* — Årsskrift, 1898.
- Kruimskål Gornuñ Klub.* — Zapiski, 1897, 11, 12; 1898, 1-8.
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- Oesterreichischer Alpenclub.* — Oesterreichische Alpen-Zeitung, XIX. 494; XX. 495-519.
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- Scottish Mountaineering Club.* — Journal, V. 25-27.
- Siebenbürgischer Karpathenverein.* — Jahrbuch, XVIII.
- Società Alpina Friulana.* — In Alto, IX. 1-6; Cronica, V., VI.; Guida della Carnia.
- Società Alpina Meridionale.* — Bollettino, VI. 1-3.
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- Thüringerwald-Verein.* — Thüringer Monatsblätter, V. 9-12; VI. 1-8.

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- Instituto Geografico Argentino.* — *Boletin*, XVIII. 7-12.
- Kais.-königliche Geographische Gesellschaft.* — *Mittheilungen*, XL.
- Nederlandsch Aardrijkskundig Genootschap.* — *Tijdschrift*, XIV. 6; XV. 1-5.
- Royal Geographical Society.* — *The Geographical Journal*, XI., XII.; *Year-book and record*, 1898.
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- Sociedade de Geographia de Lisboa.* — *Boletim*, XVI., Ser. 4-9.
- Società Geografica Italiana.* — *Bollettino*, XI. 1-12; *Memorie*, VII. 2; VIII.
- Société de Géographie (Paris).* — *Bulletin*, III.; IV.; XVII. 4; XVIII. 3; *Comptes Rendus*, 1882; 1883; 1898, 1-7.
- Société de Géographie Commerciale (Bordeaux).* — *Bulletin*, XX. 22-24; XXI. 1-22.
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- Société Khédiviale de Géographie.* — *Bulletin*, IV. Supplément; V. 1.
- Société Neuchateloise de Géographie.* — *Bulletin*, I., VI., VII., IX., X.
- Société Royale de Géographie d'Anvers.* — *Bulletin*, I.-V.; XX. 13; XXII. 1, 2; *Memoires*, I.
- Tokyo Geographical Society.* — *Journal of Geography*, X.
- Towarzystwo Ludoznawcze we Lwowie.* — *Lud*, I.-IV.
- Verein für Erdkunde.* — *Mitteilungen*, 1897.
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- Sonnblick-Verein.* — *Jahresbericht*, 1898.
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DONATIONS.

[Names of members of the Club are italicized.]

- A Painter of Monadnock. C. E. Hurd.
- Address upon the Forests of New Hampshire. J. B. Walker. Gift of Author.

- Adirondack Survey. Twelve separates. C. H. Smyth, Jr. Gift of Author.
- American Medical Botany. Jacob Bigelow. Gift of *Miss I. Batchelder*.
- Antarctic Exploration. C. R. Markham. Gift of Author.
- Astoria. 3 vols. W. Irving. Gift of *Miss I. Batchelder*.
- Autumn. H. D. Thoreau. Gift of *E. E. Norton*.
- Balsam Groves of Grandfather Mountain. S. M. Dugger. Gift of *H. P. Kelsey*.
- Bar Harbor. F. M. Crawford. Gift of *J. Ritchie, Jr.*
- Beauties of the Bosphorus. Miss J. M. Pardoe. Gift of *Miss I. Batchelder*.
- Bird-craft. M. O. Wright. Gift of *J. Ritchie, Jr.*
- Boston Park Guide. 1895. S. Baxter. Gift of *Miss I. Batchelder*.
- Boston Transit Commission. Third Annual Report. Gift of Commission.
- Botrychium ternatum Swartz, and its varieties. G. E. Davenport. Gift of Author.
- Brook Farm. J. T. Codman. Gift of Author.
- Brown Heath and Blue Bells. W. Winter. Gift of *H. P. Curtis*.
- Bubbles from the Brunnens of Nassau. F. B. Head. Gift of *Miss I. Batchelder*.
- Cape Cod. H. D. Thoreau. Gift of *E. E. Norton*.
- Captain Bonneville. 3 vols. W. Irving. Gift of *Miss I. Batchelder*.
- Cassell's Complete Pocket Guide to Europe.
- Cause of an Ice Age. J. Ball. Gift of *H. P. Curtis*.
- Cave Regions of the Ozarks. L. A. Owen. Gift of Publishers.
- Centennial of Castine. Gift of *G. H. Wüherle*.
- Chamonix and the Range of Mont Blanc. 3d ed. *E. Whymper*. Gift of Author.
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- Circassia. G. L. Ditson.
- Classification of Lavas. N. S. Shaler.
- Colony of Natal. J. F. Ingram. Gift of *J. S. Pray*.
- Conception of Species as affected by recent Investigations on Fungi. W. G. Farlow.
- Constantinople. F. M. Crawford. Gift of *J. Ritchie, Jr.*
- County Atlas of Middlesex, Mass. Gift of *Miss H. E. Freeman*.
- Cuban Sketches. J. W. Steele. Gift of *Miss I. Batchelder*.
- Dairyman's Daughter. Gift of *Miss I. Batchelder*.
- Dickens's Dictionary of London. Gift of *Miss I. Batchelder*.
- Empire of the South. Frank Presbrey. Gift of Southern Railway.
- Evangeline. H. W. Longfellow. Gift of *Miss I. Batchelder*.
- Exploration of the Caucasus. 2 vols. D. W. Freshfield and *V. Sella*. Gift of *Mrs. J. H. Thorndike*.
- Feats of the Fiord. H. Martineau. Gift of *J. Ritchie, Jr.*
- Flora of Mt. Desert Island. E. L. Rand and J. H. Redfield. Gift of *R. A. Bullock*.
- Forests of New Hampshire. J. B. Walker. Gift of Author.
- Following the Tow-path. "Allan Eric." Gift of Author.

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- Genus *Antennaria* in New England. M. L. Fernald.
 Glimpse at the Art of Japan. J. J. Jarves. Gift of *Miss I. Batchelder*.
 Guide Book to Franconia Notch and Pemigewasset Valley. F. O. Carpenter. Gift of Author.
 Guide to Geology, etc., of Vicinity of Boston. A. W. Grabau and J. E. Woodman. Gift of American Association for the Advancement of Science.
 Guide to the Androscoggin Lakes. C. A. J. Farrar. Gift of *J. Allen Crosby*.
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 In the Snake River Valley. G. F. Wright. Gift of *S. H. Scudder*.
 Land of Contrasts. J. F. Muirhead. Gift of Author.
 Letters from High Latitudes. Lord Dufferin. Gift of *Miss I. Batchelder*.
 Letters to Henry Clay. J. J. Gurney. Gift of *Miss I. Batchelder*.
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 Life in the Open Air. T. Winthrop. Gift of *Miss I. Batchelder*.
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 Mountains of California. J. Muir. Gift of *G. D. Newcomb*.
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 New Jersey Relief Map. Gift of Survey.
 North Fork of the Wapta (with album of photographs). J. Habel. Gift of Author.
 North Shore of Massachusetts. R. Grant. Gift of *J. Ritchie, Jr.*

- Notes of the Night. C. C. Abbott. Gift of A. Jones.
- Notes of Travel in Eastern Ports. Gift of J. Ritchie, Jr.
- Notes on a Carboniferous Boulder Train in Eastern Massachusetts. M. L. Fuller.
- Notes on the Nicaragua Canal. H. I. Sheldon. Gift of J. Ritchie, Jr.
- Ocean, The. W. L. Jordan. Gift of J. Ritchie, Jr.
- Physical Geography of New Jersey. R. D. Salisbury.
- Physiography of the United States. J. W. Powell and others. Gift of J. Ritchie, Jr.
- Realm of the Hapsburgs. S. Whitman. Gift of J. Ritchie, Jr.
- Remains of Land Animals in Erect Trees, etc. J. W. Dawson. Gift of Author.
- Reminiscences of a Forty-six Years' Residence in St. Thomas. J. P. Nissen. Gift of Miss I. Batchelder.
- Report of State Botanist of New York on Mushrooms. C. H. Peck. Gift of R. B. Mackintosh.
- Report on a Reëxamination of the Economical Geology of Massachusetts. E. Hitchcock.
- Right Side of the Car. J. U. Lloyd. Gift of Miss Sally Viles.
- Rock-climbing in the English Lake District. O. G. Jones. Gift of T. K. Gale.
- Ship and Shore. Gift of Miss I. Batchelder.
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- Stansbury's Expedition. 2 vols. Gift of A. Moore.
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- United States Grinnell Expedition. E. K. Kane. Gift of Miss I. Batchelder.
- United States Transcontinental Survey Map. 9 sheets. Gift of Prof. R. Pumpelly.
- United States Volvæ. C. G. Lloyd. Gift of Author.
- Up and Down Mont Blanc. Gift of A. Moore.
- Up the Rhine. T. Hood.
- Upon the Tree-tops. O. T. Miller. Gift of J. Ritchie, Jr.
- Vacation Tour Awheel. "Allan Eric." Gift of Author.
- Views in Sicily. J. F. D'Osterwald. Gift of Miss I. Batchelder.
- Voice of the Valley. Yone Noguchi. Gift of J. Ritchie, Jr.
- Walden. H. D. Thoreau. Gift of E. E. Norton.
- Wanderings in South America. Gift of Miss I. Batchelder.
- Weather Studies at the Blue Hill. R. L. Bridgman. Gift of A. Moore.
- Week on the Concord and Merrimac Rivers. H. D. Thoreau. Gift of E. E. Norton.

76 REPORT OF THE CORRESPONDING SECRETARY.

West from a Car Window. R. H. Davis. Gift of *J. Ritchie, Jr.*
Western Alps. J. Ball. Gift of Longmans & Co.
Willoughby Lake and Mountain Flora. H. H. Rusby. Gift of F. G. Floyd.
Winter. H. D. Thoreau. Gift of *E. E. Norton.*
With Ski and Sledge over Arctic Glaciers. M. Conway. Gift of *F. V. Fuller.*
Woods of Essex County. C. S. Sargent. Gift of *Miss I. Batchelder.*

6 Pamphlets. E. Abbate. Gift of Author.
Guida della Carnia. G. Marinelli. Gift of Società Alpina Friulana.
Guida della Provincia di Roma. E. Abbate. Gift of Author.
Memoria Demografica, 1895. C. P. Salas. Gift of Government of Buenos Aires.
Mont Saint-Elie. F. Gabet. Gift of Author.
Spedizione del Duca degli Abruzzi. F. de Filippi. Gift of Author.
Ueber die Temperatur. *J. Hann.* Gift of Author.
Undersökningar om det inflytande Nivåförändringen, etc.
Vevey et ses Environs.

PURCHASED.

Alpine Notes and the Climbing Foot. G. Wherry.
Beyond the Rockies. C. A. Stoddard.
By Oak and Thorn. A. Brown.
Dragons and Cherry Blossoms. R. C. Morris.
Fifth Avenue to Alaska. E. P. Pierrepont.
Glimpses of Four Continents. Duchess of Buckingham and Chandos.
Guatemala. W. T. Brigham.
In Biscayne Bay. C. W. Rockwood.
In the New Zealand Alps. E. A. Fitzgerald.
Japan as we saw it. M. Bickerstreth.
Land of the Castanet. Taylor. H. C. Chatfield.
Mentone, Cairo, Corfu. C. F. Woolson.
My Village. E. B. Smith.
Old Spain and New Spain. H. M. Field.
Russia. E. P. Bazán.
Some Common Birds. P. M. Silloway.
Thlinkets of Southeastern Alaska. F. Knapp and R. S. Childe.
Unbeaten Tracks in Japan. I. L. Bird.
With Sack and Stock in Alaska. G. Broke.

U. S. Geological Survey. 10 maps.

Treasurer's Report for 1898.

THE year began with a cash balance of \$23.07 and ended with a balance of \$513.77, besides the amounts held for special use, and we have paid the temporary loan of \$250. As we began the year with so little cash on hand, it seemed wise to ask for close economy in the Departments; and the balance is now not so large as it should be, considering the large fixed charges which our increasing membership imposes upon us.

The reports of the Librarian and of the Councillors will show the purposes for which money has been used, and will also show incidentally to what advantage larger amounts could well be expended.

This suggests again the great desirability of larger invested funds, the income from which could be depended on to meet some of the necessary expenses of the Club. The question was dealt with in my report of eleven years ago, and there is little that is new to be said on the subject. We have had no large gift of money; our funds have only been increased by moderate contributions of our members through payments for Life-membership. The Permanent and Reserve Funds, eleven years ago, amounted to \$2500, and now amount to \$5577. The increase during the past year by life-membership fees has been \$420, being the largest in the history of the Club in any one year.

Other items of the cash account show satisfactory progress. We have had the largest amount ever received for admissions, and the largest for assessments. The amount received for interest has been less than for several years past, for reasons given in last year's report, explaining the use of a portion of the Reserve Fund.

The donations, especially for room expenses, have been very satisfactory during the past year. Members of course entered upon a long undertaking in promising to continue such payments for a five-year period. So many things happen in that time, and so many new calls are presented to one's attention, that it is easy to find old demands burdensome; but loyalty to the Club has been such that very few have dropped out of the list of contributors. Contributions for the room have been received from 162 members, amounting to \$412.75. Of this

amount, payments in advance have increased the room fund to \$153.

The receipts and payments of the year were as follows :—

RECEIPTS.

Cash on hand, Jan. 1, 1898	\$23.07	
“ for Room fund	124.00	
“ for Eliot Memorial Fund	86.00	
		\$233.07
Life-Memberships : Edwin G. McInness, Eleanor Baldwin, Mary Alma Coe, Nathaniel T. Kidder, Charles F. Mason, Stephen A. Breed, Charles C. Schoolcraft, Mrs. Charles H. Sanders, Kate W. Cushing, Elizabeth W. Silsbee, Parker B. Field, Mrs. Parker B. Field, John E. Alden, Mrs. John E. Alden,		
14 at \$30		420.00
Admission Fees :		
From 134 new members at \$5	670.00	
Assessments :		
From 3 members for 1897		
“ 745 “ “ 1898		
“ 9 “ “ 1899		
757 members at \$3.		2271.00
Interest :		
On Permanent Fund for 1897	\$150.37	
“ Reserve Fund “ “	31.10	
“ Treasurer's accounts for 1898	17.33	
		198.80
APPALACHIA and other publications :		
Sales of APPALACHIA and maps in 1896.	15.73	
“ “ “ “ “ 1897.	81.71	
“ “ “ “ “ 1898.	17.56	
“ “ Walks and Rides “ 1898.	470.50	
		585.50
Donations :		
From S. H. Scudder to APPALACHIA VIII., 4	22.00	
“ E. S. Balch “ “ “	20.00	
“ Mrs. J. H. Thorndike for Library	13.00	
“ Hotel-keepers for Carter Notch Paths and Camp	34.00	
“ members for Library	7.00	
“ “ “ Room	412.75	
		508.75
Sella Collection :		
For Sale of Catalogues in Denver, Chicago, and Boston		28.90
Room :		
For Meetings and Rennions		29.00

TREASURER'S REPORT.

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Department of Topography :		
For sale of Maps of Northern Slopes	54.30	
Annual Reception :		
Received from the Committee	35.09	
Field Meetings and Excursions :		
Received from the Committee	80.00	
	<u> </u>	4461.34
		<u>5114.41</u>

PAYMENTS.

Trustees of the Permanent Fund :		
For 14 Life-Memberships	\$420.00	
Temporary Loan :		
For amount paid	250.00	
Postage and Stationery	\$182.90	
Printing and Advertising	\$157.88	
For Club Register for 1898	134.83	
	<u> </u>	292.71
Clerical Services	249.50	
Library :		
For Books	69.78	
" Binding	92.18	
	<u> </u>	161.96
Expenses of meetings	181.85	
Room :		
For rent and care 1049-51 Tremont Build- ing 13 months	\$1220.96	
" Storage	21.60	
" Light	26.41	
" Fittings and supplies	40.96	
	<u> </u>	1309.93
Department of Topography :		
For making blue prints of Map of Northern Slopes	30.56	
Department of Art :		
For Photographs and Albums	28.10	
" expense of Sella Exhibition in Boston	46.29	
	<u> </u>	74.39
Department of Exploration :		
For a Prismatic Compass	15.50	
Department of Improvements :		
For Paths and Camps	154.85	
APPALACHIA and other Publications :		
For Vol. VIII., No. 3 reprints	4.64	
" Vol. VIII., No. 4	655.30	
" Delivery, do.	88.49	
" Expense, business agent	50.00	
" Walks and Rides about Boston	181.46	
	<u> </u>	979.89
Real Estate :		
For expenses	57.60	

TREASURER'S REPORT.

Total expenses	3691.64
Cash on hand, Dec. 31, 1898	513.77
“ “ “ Room-fund	153.00
“ “ “ Eliot Memorial Fund	86.00
	<hr/> 752.77
	<hr/> 5114.41
	<hr/>

Respectfully submitted,

JOHN E. ALDEN,

Treasurer.

The Committee appointed to examine the accounts of the Appalachian Mountain Club respectfully report:—

We have examined the accounts of the Treasurer for the year 1898, and believe them to be correct. Proper vouchers were shown for all payments, and the cash on hand was verified, amounting to seven hundred and fifty-two dollars and seventy-seven cents (\$752.77).

We have examined the accounts of the Trustees of the Permanent and Reserve Funds, and find them to be correct.

The Permanent Fund amounts to four thousand four hundred and fifty-three dollars and ninety-five cents (\$4453.95), and the accumulated interest on hand is one hundred and fifty dollars and sixty-two cents (\$150.62); total, \$4604.57.

The Reserve Fund amounts to eleven hundred and twenty-three dollars and nineteen cents (\$1123.19), and the accrued interest on hand is thirty-seven dollars and ninety-eight cents (\$37.98); total, \$1161.17.

The investments, as reported by the Trustees, have been verified.

Respectfully submitted:

ALVIN R. BAILEY,	} <i>Auditing</i>
HENRY S. BEAN,	
C. N. MASON,	

BOSTON, MASS., January 6, 1899.

TREASURER'S REPORT.

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RECEIPTS FOR FIRST TWENTY-THREE YEARS.

YEAR.	MEMBERSHIPS.					Life Membership.	Sales of APPALACHIA and other publications.	Interest.	Annual Reception.	Field Meetings and Excursions.	Donations.	Total.
	Admission Fees.	Yearly Assessments.	Back Assessments.	Advance Assessments.	Total.							
1876	252.00	....	....	....	252.00	....	43.13	....	....	....	....	295.13
1877	50.00	254.00	8.00	....	312.00	....	98.00	....	....	....	....	410.00
1878	54.00	264.00	....	....	318.00	60.00	75.70	....	....	....	43.00	496.70
1879	148.00	256.00	40.00	4.00	448.00	....	130.85	1.90	....	....	221.70	802.45
1880	178.00	332.00	24.00	4.00	538.00	90.00	116.90	10.79	....	....	86.21	841.90
1881	222.00	384.00	18.00	12.00	636.00	120.00	141.40	17.59	....	....	62.55	977.54
1882	256.00	528.00	74.00	....	858.00	90.00	309.43	22.07	....	....	2.00	1281.50
1883	395.00	1000.00	20.00	27.00	1442.00	210.00	197.58	39.72	9.72	82.88	22.00	2003.90
1884	285.00	1059.00	21.00	9.00	1374.00	60.00	93.51	53.29	26.80	11.47	1.00	1620.07
1885	375.00	1212.00	69.00	12.00	1668.00	60.00	113.19	61.09	45	70.73	534.50	2507.96
1886	426.00	1317.00	90.00	24.00	1857.00	330.00	247.94	88.62	12.50	124.35	364.20	3024.61
1887	385.00	1491.00	90.00	42.00	2008.00	180.00	183.80	79.34	10.00	40.20	114.00	2615.34
1888	355.00	1536.00	117.00	12.00	2020.00	180.00	67.06	42.52	9.20	45.94	754.76	3119.48
1889	655.00	1617.00	69.00	27.00	2368.00	120.00	93.85	151.29	11.48	....	127.60	2822.22
1890	450.00	1620.00	24.00	15.00	2109.00	150.00	1168.13	217.12	3.73	....	220.85	3868.83
1891	500.00	1743.00	12.00	9.00	2264.00	120.00	354.28	182.54	....	146.27	20.00	3087.09
1892	560.00	1830.00	15.00	9.00	2414.00	300.00	625.22	130.29	....	70.58	.50	3540.59
1893	480.00	1908.00	6.00	....	2394.00	300.00	20.97	431.90	....	13.57	454.50	3614.94
1894	640.00	1968.00	9.00	12.00	2629.00	210.00	407.30	17.65	....	14.04	22.25	3300.24
1895	385.00	2016.00	6.00	12.00	2419.00	90.00	66.69	241.70	20.55	....	10.00	2847.94
1896	510.00	2076.00	6.00	42.00	2634.00	180.00	83.37	225.45	4.97	50.00	276.00	3453.79
1897	650.00	2094.00	18.00	15.00	2777.00	150.00	1197.87	251.48	....	155.00	451.18	4982.53
1898	670.00	2235.00	9.00	27.00	2941.00	420.00	668.70	198.80	35.09	80.00	508.75	4852.34
Total	8881.00	28740.00	745.00	314.00	38680.00	3420.00	6504.87	2465.15	144.49	905.03	4297.55	56417.09

EXPENDITURES FOR FIRST TWENTY-THREE YEARS.

YEAR.	Permanent Fund.	Reserve Fund.	Stationery, Postage, and Printing.	APPALACHIA and other Publications.	Department of Topography.	Improvements and Explorations.	Natural History and Art.	Clerical Expenses.	Expenses of Meetings.	Library.	Club Room.	Donations.	Total.
1876	....	....	109.91	140.86	....	15.00	....	....	....	....	....	....	265.77
1877	....	....	60.65	364.13	....	....	13.45	....	....	....	....	....	438.23
1878	....	....	202.31	189.80	2.00	20.00	52.48	....	....	....	....	....	446.59
1879	60.00	....	162.31	347.92	19.20	158.76	....	....	....	....	....	....	748.19
1880	90.00	....	186.17	318.13	19.00	72.60	....	....	....	....	....	....	685.90
1881	120.00	....	394.09	246.23	37.95	68.00	....	19.75	22.70	....	....	....	908.72
1882	90.00	....	258.59	675.93	25.40	....	....	34.50	25.00	....	....	....	1109.82
1883	281.72	....	389.73	366.27	23.65	160.37	....	67.41	1.38	69.78	....	....	1360.31
1884	113.42	....	382.49	1176.53	....	21.00	....	57.62	....	58.10	....	....	1809.16
1885	86.48	....	363.27	361.31	229.00	102.00	....	106.00	53.06	72.50	284.17	25.00	1682.79
1886	270.00	....	432.38	932.91	77.73	46.00	74.00	121.45	171.15	131.72	667.30	49.88	2974.52
1887	388.38	1000.00	289.38	566.71	538.97	123.02	20.12	107.12	145.45	102.50	504.81	....	3796.46
1888	280.00	100.00	473.95	597.59	....	779.55	8.32	49.50	93.45	120.56	456.12	....	2959.04
1889	220.00	114.70	390.77	1127.91	7.20	118.58	86.76	123.75	68.86	67.33	487.34	....	2513.20
1890	283.48	48.59	463.43	1682.95	....	46.07	101.56	181.00	58.35	96.06	464.95	....	3426.44
1891	305.64	605.71	389.27	833.17	50.00	123.00	45.36	191.50	121.60	117.10	471.69	105.30	3359.34
1892	395.56	200.00	438.72	1059.89	216.33	46.60	122.39	197.50	133.95	113.45	534.08	61.34	3523.81
1893	415.27	74.97	446.07	1086.18	....	684.15	664.45	221.95	203.70	59.10	576.04	25.00	4456.88
1894	210.00	....	398.49	947.59	....	228.75	74.48	236.80	194.14	89.66	540.28	25.00	2945.19
1895	90.00	79.22	402.75	671.57	164.43	205.35	109.78	249.75	157.05	128.56	493.90	25.00	2677.36
1896	180.00	900.00	394.03	2418.28	40.39	337.08	47.62	248.00	180.05	139.99	855.48	25.00	4866.52
1897	150.00	900.00	606.15	2473.97	....	387.82	79.11	258.50	171.13	142.10	1243.66	25.00	5327.44
1898	420.00	....	475.61	979.89	30.56	227.95	74.39	249.50	181.85	161.96	1280.93	....	4082.64
Total	4453.95	1123.19	8010.92	19445.72	1482.41	3971.65	1574.27	2721.60	1982.87	1670.47	8860.75	306.52	55664.32

¹ Decrease.

Report of the Trustees of the Permanent Fund for the Year 1898.

PERMANENT FUND. — PRINCIPAL.

1898.

Jan. 12.	Amount Permanent Fund on hand last account	\$4033.95
"	Amount Interest on hand per last account	\$150.37
May 31.	Paid J. E. Alden, Treasurer, accrued interest of the year 1897, as per vote of Council	150.37

Amounts received from J. E. Alden, Treasurer, for Life-Memberships during year :—

Mar. 19.	Miss Eleanor Baldwin	30.00
"	Edward G. McInnis	30.00
May 26.	Miss Mary Alma Coe	30.00
"	Nathaniel P. Kidder	30.00
June 27.	Charles F. Mason	30.00
"	Stephen A. Breed	30.00
"	Charles C. Schoolcraft	30.00
Dec. 16.	Miss Sarah E. A. Sanders	30.00
"	" Kate W. Cushing	30.00
"	" Elizabeth W. Silsbee	30.00
"	Parker B. Field	30.00
"	Mrs. Parker B. Field	30.00
"	John E. Alden	30.00
"	Mrs. John E. Alden	30.00
		<u>420.00</u>
Total Principal on hand, Jan. 1, 1899		\$4453.95

PERMANENT FUND. — INTEREST.

1899.

Jan. 1.	Suffolk Savings Bank: 12 months, to October 1, 1898, at $3\frac{1}{2}\%$	\$56.00
"	Provident Institution for Savings: 12 months, to July 1, 1898, at $3\frac{1}{2}\%$	44.73
"	Lexington Savings Bank: 12 months, to October 1, 1898, at 4%	37.18
"	Eliot Five Cents Savings Bank: 12 months, to October 1, 1898, at $3\frac{3}{4}\%$	7.23
"	Canton Institution for Savings: 12 months, to October 1, 1898, at 4%	5.48
Total interest accrued during year		<u>\$150.62</u>
"	Total Permanent Fund, Principal and Interest	\$4604.57

TRUSTEES' REPORT.

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Deposited as follows :—

Suffolk Savings Bank, Book No. 100,573 . .	1708.38
Provident Institution for Savings, Book No. 118,265	1312.24
Lexington Savings Bank, Book No. 1921 . .	958.13
Eliot Five Cents Savings Bank, Book No. 32,233	298.91
Canton Institution for Savings, Book No. 9015	326.91
	<u>\$4604.57</u>

RESERVE FUND.—PRINCIPAL.

1898.		
Jan. 12.	Amount Fund on hand, per last account . .	\$1123.19
"	Amount Interest on hand, per last account .	\$31.10
May 31.	Paid J. E. Alden, Treasurer, accrued interest for year 1897	31.10

RESERVE FUND.—INTEREST.

1899.		
Jan. 1.	Boston Five Cents Savings Bank, to Octo- ber 1, 1898, at 3½ %	\$28.56
	Massachusetts Loan and Trust Co.'s note to January, 1899, at 3 %	9.42
	Total Interest accrued during year	<u>\$37.98</u>
	Total Reserve Fund, Principal, and Interest.	\$1161.17
	This is deposited in—	
	Boston Five Cents Savings Bank, Book No. 229,173	837.56
	Massachusetts Loan and Trust Co.'s note . .	323.61
		<u>\$1161.17</u>
	Total Permanent Fund, Principal, and Inter- est	\$4604.57
	Total Reserve Fund, Principal, and Interest .	1161.17
	Total in hands of Trustees	<u>\$5765.74</u>

CHARLES H. FRENCH, } Trustees of Per-
REST F. CURTIS, } manent and
ISAAC Y. CHUBBUCK, } Reserve Funds.

BOSTON, January 12, 1899.

Report of the Trustees of Real Estate.

SINCE the last annual meeting, the Club has become the owner, through the gift of Miss Sarah B. Fay, of about two hundred acres of land in the towns of Woodstock and Lincoln in the State of New Hampshire, and your trustees expect in the early spring to enclose this land, build paths, and open it for the use and convenience of the public. It is to be known as the Joseph Story Fay Reservation in memory of Miss Fay's father, "a tree-lover, tree-planter, and tree-preserver." A petition had been presented to the Selectmen of Woodstock for the laying out of a new highway over a portion of the Reservation, but upon our protest it was abandoned.

The work of gradually improving the Shelburne and Randolph reservations has been continued, and the work upon the former already shows that in the course of a few years the tract will have been restored to its former picturesqueness. In addition to the taxes paid upon these reservations we have expended the sum of \$6.25 in the care and improvement of the Shelburne Reservation.

It has recently been brought to our attention that a sale has been made by Brown's Lumber Company of several thousands of acres of woodland to the north of the Presidential Range, and the danger is imminent that this whole area will be denuded for the making of wood pulp. If so, all the region around our Randolph Reservation, up the slopes of Madison, Adams, and Jefferson, over favorite climbing territory, will be completely cleared of its trees.

Many suggestions and requests have come to us for the purchase of woodland in New Hampshire and Vermont, some of it very desirable; but as we have no money except what is given to us by the lovers of forests, we have been unable to do anything so far in this direction. Some additional gifts of land, however, are quite possible, and one or more of them may be made in the coming year.

HARVEY W. SHEPARD,	}	<i>Trustees of Real Estate.</i>
CHARLES E. FAY,		
J. RAYNER EDMANDS,		
CHARLES L. NOYES,		

Report of the Councillors for the Autumn of 1898.**Topography.**

BY GORDON H. TAYLOR.

THE Councillor regrets that absence from this part of the country during a considerable part of the year has prevented him from doing as much as he would have liked to do in his department, and that a plane table survey and sketch map, made on a snowshoe trip to Wonalancet, N. H., is not yet available for general use. This survey included the section immediately south of the district covered by the U. S. Geological Survey, and included Mts. Chocorua, Paugus, Passaconaway, Whiteface, Sandwich Dome (Black Mt.), and Israel, with other lower summits in the vicinity.

It brought out the fact that these mountains had never previously been mapped with any approach to accuracy, the relative positions of Paugus, Passaconaway, and Wonalancet being so much distorted on all existing maps where they appeared as to be more confusing than helpful.

The map of "Paths on the Northern Slopes of Madison, Adams, and Jefferson" prepared last year by Louis F. Cutler has been in considerable demand this year both by club members and others at various points in the neighboring resorts where it has been for sale.

The work which Mr. E. G. Chamberlain has carried on for several years in the region of the Charles River has been extended in the direction of Hundred Woods in Weston and Wellesley. He finds that Mt. Pennell, 340 feet high, is the greatest elevation in this region.

In addition to the ten panoramic views which Mr. Chamberlain has previously elaborated for the use of Club members, he has this year added one from Mangus Hill, Wellesley, another from Lawrence Water Tower, published in the Lawrence Telegram of Oct. 26, and has done work in the same line from Holt Hill in Andover, Powow Hill in Amesbury, Tilton's Tower in Haverhill, and Lincoln Reservoir. It is hoped that it will soon be possible to publish these panoramic views in such form that they may be readily accessible to all members.

Reports of the Councillors for the Autumn of 1898.**Art.**

BY HELEN E. ENDICOTT.

THE Councillor of Arts has the pleasure of recording for the past year additions to the photographic collection representing several widely separated mountain regions.

We have received as a gift from Mrs. P. R. Hollingsworth and Miss Rose Hollingsworth a framed photograph of Mt. Simolochum, which is said to be the most beautiful mountain in the Himalayas. This has been hung in the Club rooms.

Signor Sella has presented a set of his Alaskan photographs taken in the summer of 1897, during the Italian expedition to Mt. St. Elias, and Mr. Henry G. Bryant of Philadelphia, who attempted this ascent the same season, has sent us his photographs taken during the trip.

Switzerland is represented in the collection for the year by lithographic views, the gift of Dr. E. Peabody Gerry of Jamaica Plain, and the Sierra Nevada by twenty-five photographs presented by Professor J. N. Le Conte of Berkeley, Cal., taken by him in the region between the Yosemite and King's River Canyon.

The collection of platinotypes of the English Lake Country, begun last year, has been increased by the purchase of ten additional pictures, and a few Japanese photographs were bought as the basis of a set of Japanese mountain and river views.

Photographs of less remote regions have been contributed by several members of the Club. Mr. Charles E. Lord has presented a large framed panorama of Mt. Chocorua, which has been hung at the Club room, Mr. Albert S. Parsons has given a number of views taken in the neighborhood of Mt. Grace, in Warwick, Mass., and several photographs of the Carter Notch Camp have been given by Mr. Parker B. Field.

We have also received from Mr. William H. Cades a series of blue prints, making a complete study of the cascade in the Middlesex Fells. The collection of Mt. Desert photographs, begun last year, has been increased by additional pictures presented by Mr. Frederic Endicott and Miss Charlotte M. Endi-

cott, and photographs taken at the Field Meeting in July have been given by Mr. Charles H. Sanders, Mr. H. C. Parker, and Mr. I. E. Sawyer, which, with some others that have been promised for some later date, will be added to the Adirondack collection. Another recent gift is the set of albums and photographic materials presented by the Carter Ink Company.

Several exhibitions have been given during the year. In February a large number of photographs loaned by members and friends were exhibited at the Annual Reception at the Vendome. In March Mr. Peabody's White Mountain photographs, loaned by the Boston and Maine Railroad Company, were shown at the Room Committee's reception. In May the Alaskan views of Signor Sella and Mr. Bryant, together with Mr. Peabody's Mt. Washington from Lake Winnetoesaukee and a large number of English Lake Country views, loaned by Mr. Charles Pollock, were exhibited at the reception held by President and Mrs. Niles.

During the meeting of the American Association for the Advancement of Science, the Sella Collection was exhibited at the Boston Art Club by the committee in charge of the collection. The exhibitions arranged for the reunions of the Waterville, Adirondack, and Dixville parties, by the committees in charge of those excursions, were left wholly or in part at the Club room for the week succeeding each reunion.

Mounting and binding photographs has completed the work of the department.

REPORT OF THE COMMITTEE ON THE SELLA COLLECTION.

THE year just ended has been a very interesting one in the history of the Sella Collection.

When our last report was presented the Collection was on exhibition under the auspices of the University of Chicago, having gotten so far East after a transcontinental tour, during which it was seen in Portland, San Francisco, and Denver. As considerable effort had been made to secure its exhibition in Chicago, — several organizations having felt compelled for different reasons to forego the opportunity of receiving it, — it is the more satisfactory to be able to report that, immediately after a successful exhibition at the University, it was displayed a sec-

and time in that city under the oversight of the Lewis Institute. Our fellow-member, Mr. C. S. Thompson of Chicago, was untiring in his efforts to furnish a view of the Collection to his fellow-citizens, and it was also largely due to his initiative, in conjunction with the Rev. H. P. Nichols of Minneapolis, that it was next forwarded to this latter city and exhibited for a week under the auspices of the Minnesota Academy of Sciences. From here it was shipped to Boston, where it arrived in excellent condition, for the most part, after an absence of nearly two years. A few of the prints had deteriorated somewhat by fading, but in nearly all instances they were practically as fresh as when they arrived in America in 1893. The mounts have naturally suffered some injury, especially at the corners from the driving of tacks.

We are sorry to report a loss of some seventeen pictures out of the four hundred and fifty and more forming the Collection. It is hoped that they may be replaced at an early day, and that in future a complete system of checking on their receipt at places of exhibition and their departure therefrom will, if not always prevent loss, at least locate responsibility.

The fiftieth anniversary of the American Association for the Advancement of Science, which was celebrated in Boston in August, afforded a new occasion for these pictures to be seen in our city under conditions very similar to those under which it was originally exhibited. The Boston Art Club, which at that time placed its fine gallery at our disposition, now united with our Club in inviting the members of the Association and their friends to a duplicate of that exhibit. The gallery was open daily during the week from nine o'clock until sunset, and on the opening evening until ten. In spite of the insufferably hot weather, a large number took occasion to visit the exhibition. The work of hanging and removing the pictures was done under the supervision of the Councillor of Art, with the kind coöperation of members of our Club.

Meanwhile for several months a plan had been maturing which for breadth of reach surpasses all previous schemes for employing this fine collection as an educative factor. This plan may be regarded as the direct outcome of the interest first taken two years ago by Mr. Charles Cutter of the Forbes Library, Northampton, Mass., for through him the views became widely known to librarians throughout the country.

During the past years there has been formed an association of public librarians in New England under the name of The Library Art Club, with a view to public exhibitions of photographs and works of art. Its Secretary, a member of our Club, Miss Mary E. Sargent, the librarian of the Medford Public Library, saw here an opportunity to

utilize the Sella Collection. The matter having been brought to the attention of the governing board of the new organization, an elaborate scheme was at once devised for exhibitions in the upward of thirty towns and cities in which there are affiliated libraries. In November the Collection was turned over to their committee, who become responsible for it during the time it remains in their hands, probably for considerably longer than a year. The Chairman of the Library Art Club has estimated that as many as six hundred thousand persons will have at least the opportunity of seeing these views. The percentage who will avail themselves of it will naturally be very much larger in these communities of small or moderate size than in larger places, and the influence exerted will be correspondingly greater than in our overbusy municipalities. For greater effectiveness three groups of about one hundred pictures each will be selected from among the best and most characteristic views, which will be exhibited simultaneously in as many different places, and each sent in turn to all the libraries of the Association.

Requests are also on file for other exhibitions, some of them beyond the limits of New England ; so that it seems hardly probable that the question how best to arrange the Collection for easy access in the Club room will press upon the Committee for an early solution.

CHARLES E. FAY,	} Committee on the Sella Collection.
HELEN E. ENDICOTT,	
WILLIAM H. LAWRENCE,	
WILLIAM O. WITHERELL,	

Reports of the Councillors for the Autumn of 1898.

Exploration.

BY CHARLES L. NOYES.

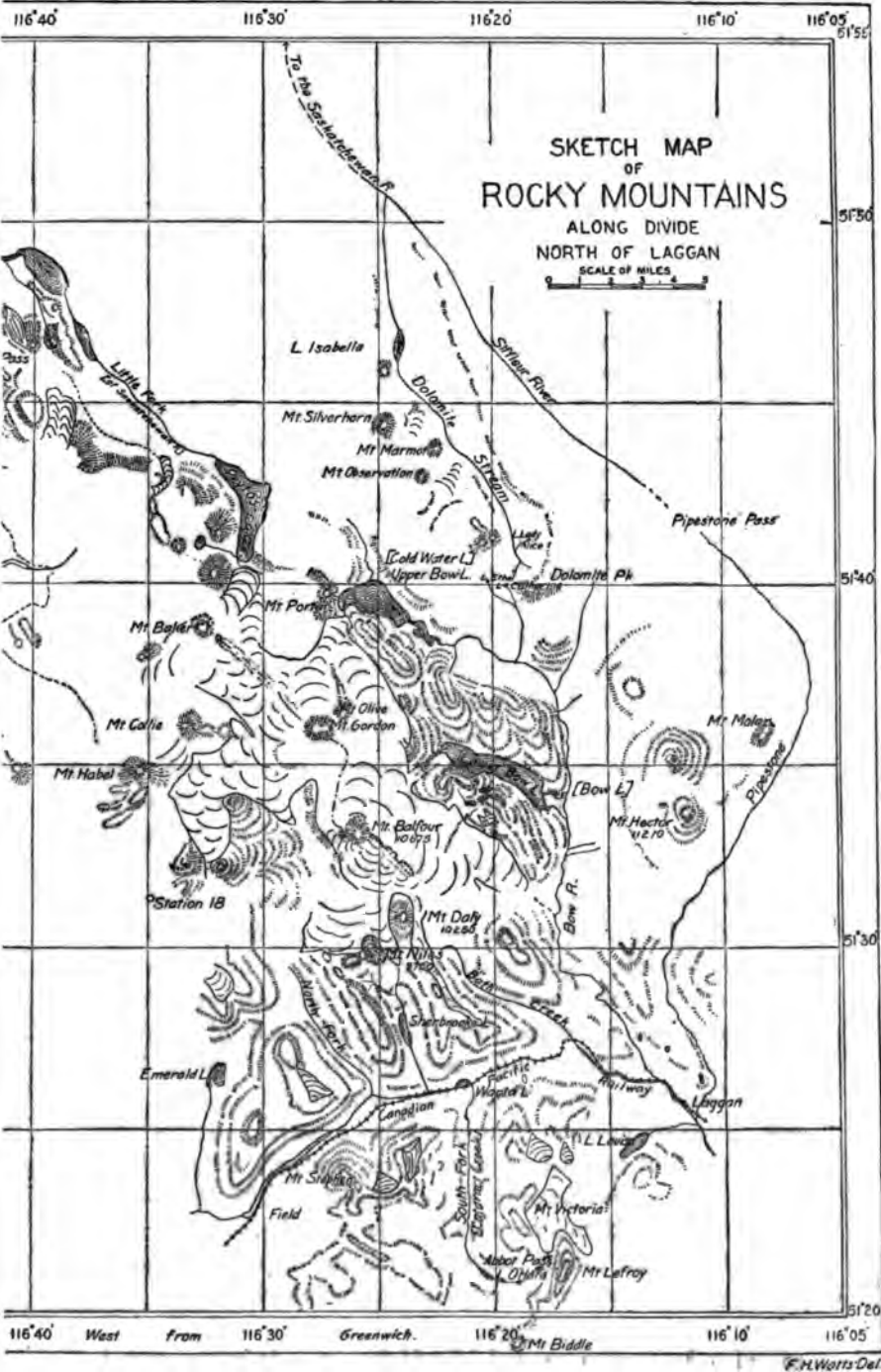
AGAIN the only accounts of exploration which have reached the Councillor have been in the region of the Canadian Rockies. Two parties composed of members of the Appalachian Mountain Club were occupied there a few weeks this summer, both of them in the vicinity of the Continental Divide immediately north of the line of the Canadian Pacific Railway.

One of these, consisting of Charles S. Thompson, Harry P. Nichols, and George M. Weed, and the Councillor of Exploration, set out on the 31st of July up Pipestone Creek, which joins

the Bow River a little east of Laggan, gradually diverging from it toward the northeast. This route was chosen to avoid the bad travelling through the "blow-down" on the Bow route, try a new region, visit Mount Molar, locate Mount Murchison, reported by Palliser to be at the head of Pipestone Pass, and find a cross pass thought to open from the Pipestone into the Bow valleys. This pass, which we did not find, is probably entered by a stream trending slightly westward from the Pipestone near the foot of Molar, about a dozen miles of easy going north of Laggan, where we made our first camp. A day and a half's travel from here, by a rapidly rising grade curving to the westward, brought us to the head of Pipestone Pass, a comfortable and easy route all the way for horses, as is also the descent along the Siffleur. The scenery through both these valleys is full of bold, picturesque features in the enclosing cliffs and glaciated peaks, of pleasant charm in the broad, richly flowered meadows into which the few short defiles open, and its grassy alps, that skirt along the high cliff walls and meet in the broad floor at the head of the pass. There are, however, no very striking mountains, nothing that would answer to Mount Murchison, anywhere in view along either stream. The only formation to which we gave a name was a strikingly symmetrical rampart and turret at the very head of the pass, which we named the "Watchtower."

A day from the head of the pass, at a level of 8100 feet, brought us to the junction of the Siffleur with a stream of twice its volume, swift and turbid, doubtless swollen above its normal size by the melting of snow that flooded all streams this very hot summer. Our general direction had come to be nearly northwest by the time we reached this stream; as we followed up its course we found ourselves moving only a few points west of south, and by the time we reached the pass at its head, after a day and a half of climbing, we were facing the southeast, by compass, the way being absolutely closed before us by an abrupt wall of rock with jagged outline, rising out of a small snow-field and glacier that feeds the stream. An opening, however, breaks through sharply to the right, leading west and then south again to the foot of the Upper Bow Lake, just under the "Canadian Dolomite,"¹

¹ See APPALACHIA, March, 1898, p. 325.



PRINCIPAL FIELD OF EXPLORATIONS IN 1898.



Geological Map of Hill

the northern face of which, therefore, had confronted us with its bristling rampart as we came up the pass. The height of this newly discovered and traversed pass, which we named Dolomite Pass, we found by aneroid 8100 feet, the same as that of the Pipestone. Set along the crown of the pass are four lakes, three of which we named in order from north to south, Lady Alice, Katharine, and Ethel. The fourth, on the very summit of the pass, of a pale opaque green, is left unnamed. A still larger lake on Dolomite stream, at which we camped, about a half day's travel above the junction of the Siffleur, we named Lake Isabella. A fuller description of the making of this pass, its strikingly wild and grand scenery, and the adventures of our passage is printed in APPALACHIA. Though there is no trail except relics of Indian trails as far as the foot of the lower canyon, there are no insuperable difficulties for horses, and only at a few points can it be called difficult for them. From the head of the pass we climbed, by an easy ascent, a mountain, 9750 feet (by aneroid) in elevation, the most satisfactory view-point, we agreed, that we had reached in the Rockies, and named it Mount Observation. The passage down to the Bow River we found short and easy, and reached the head of the upper lake in a half day's travel, having been out eight days from Laggan.

Our explorations henceforth were on the Waputehk snow-field, which we crossed from east to west, and its lower section from north to south. The glacier at the head of Upper Bow Lake we turned into a highway, traversing it three times. A walk of about six miles across the snow-field, from the head of this glacier by the Palisade, brought us to the foot of a peak, sighted by our party of 1897 from Mount Gordon and named Mount Collie. This proved a mountain of very noble and diversified feature. After a careful circuit between crevasses and under cliffs, we reached the snow arête leading to the summit at a level of 10,100 feet, but were stopped there by cornices, schrunds, and iced slopes, which, in the state of the snow this year, thoroughly debarred further progress. From this point, from the slopes of Palisade Mountain, later from points farther north, and on Balfour we took bearings upon the prominent peaks and features of the snow-field which have proved of value in

mapping the snow-field, for completion of the map prepared from the observations of the year before under the direction of Mr. G. P. Baker, an outline sketch of a portion of which is printed with this number of APPALACHIA.

Having passed over the low divide, 6300 feet, to Peyto's Lake, scenically the grandest of the lakes yet visited by us in the Rockies, we ascended its magnificent sinuous glacier, by an easy traverse, to the moraine on its left, and by this to its upper table, an immense expanse of ice which broadens into the snow-field, and is girt about with some richly contoured mountains. From here we traversed the snow-field, southward for six hours to Vulture Col, from which we might perhaps have worked down to the level of the ice below Mount Balfour. This we did not attempt, as we could see no way to cross over to Balfour on the upper reach of the glacier leading to the head of Lower Bow Lake. Two days later we made the ascent of Balfour from Lower Bow Lake by way of Margaret and Turquoise Lakes, over the ridge extending southeasterly from Balfour. This was crossed at 11 A. M. by a snowy pass east through a gateway of the "Hoodooed Ridge," to the great névé on the west of the crest of the divide. Thence by a long traverse over the snow, and on the ridge itself, till we came to the cleft which breaks it, about an hour from the summit. This break we circumvented by slabbing down to the snow and up again on the western face, and then along the narrow arête to the summit, which we reached at 3 P. M., nine hours from our start on Lower Bow Lake.

While at Glacier House a few days later, Mr. Weed and myself amused ourselves for a couple of days in exploring the southeastern skirts of the Illicilliwaet Névé, especially to ascertain whether there was any access from it to Sir Donald. The year before the party fancied that they could see from the peaks west of the Asulkan Glacier a narrow couloir leading down from the summit of Sir Donald to the névé. No such approach exists, but the snow-field ends abruptly in cliffs that drop down sheer toward Beaver Creek. In one place where there is a break in the ridge the section of which is seen as Green's Peak from Glacier House, there is a possibility of getting down to a glacier a couple of thousand feet below, and it may be that one could work through its crevasses and reach the

southwest arête of Sir Donald, but even that would be a difficult climb. The problem of finding a breach in the defences of this noble peak is shown only the more difficult by this reconnoissance.

THE SOUTHERN END OF THE WAPUTEHK SNOW-FIELD: ABBOT
PASS: THE ILLICILLIWAET NÉVÉ. BY CHARLES E. FAY.

WITH a third man (Campbell), furnished by T. E. Wilson of Banff, Mr. R. F. Curtis and myself started on August 2 to attempt the ascent of Mount Balfour from the south, and incidentally to explore the southern end of the Waputehk snow-field.

A study of photographs taken by the Dominion Topographical Survey, from the summit of Mount Stephen and from "Station 18," suggested a probably feasible route by way of the short valley next east of the North Fork of the Wapta, that of the only important tributary of the Wapta between the North Fork and the continental watershed. Although some doubt attached to our readily getting to the foot of the glacier from this valley, the probabilities were as favorable as those connected with the route by way of Bath Creek, the first stream east of the watershed, by which it had been our purpose to approach Mount Balfour in 1896. Had we already seen the photographs made by the Survey from a station on an eastern spur of Cathedral Peak (C Hector, 8575 feet) and lying directly opposite to the entrance to our valley, we should have had little doubt that it offered a most promising route. Weighing our chances we selected it, and our experience proved it the most easy access to the great snow-field from the line of the railway, it being in an air-line only about four and a half miles from the railway to the end of the glacier. The walking distance is perhaps seven miles.

We left the handcar by which ourselves and our effects had been brought the mile and a half from Hector Station, at 10.15 A. M. We were here at the mouth of the rushing stream issuing from the valley we intended to enter. Keeping to the right, we ascended the steep face of the glacial terrace which here abuts on the Wapta Valley, and bore gradually from the stream, choosing the best travelling through the dead but still standing timber. At noon we came upon a fine lake something over a mile in length, whose pale blue waters settled once for all the question as to whether our valley led directly to the glacier. We spent a long nooning at its foot, and at 1.30 got under way, skirting the lake on its easterly edge.

Just before reaching the upper end of the lake, the bank rose as a sharp clayey bluff crowned with a difficult scrubby growth, which considerably delayed our progress, so that it was 2.15 when we reached the upper end.

Just beyond this pretty sheet of water, which we have since heard called "Sherbrooke Lake," the torrent supplying it descends some two hundred feet from the next bench, by a rough canyon; so we again left the stream, and bore to the right into good timber (30 min.), after which we found ourselves at the foot of a level marshy meadow, evidently a silted-up lake-bed. Beyond this the stream is divided, the left-hand branch (as one faces up) descending through forest in a striking series of cascades, the right-hand more gently through open land. These streams come from different sides of a great spur, reaching out from the peak we later called "Mount Niles."

Taking the right-hand valley at 4.00 o'clock, we reached an hour later a pleasant camping-ground (at 6700¹ feet) on the northerly base of a knoll whose summit commands a fine view down the valley and of the great peaks south of the railway, — Mounts Victoria, Huber, Biddle, and Cathedral Peak. Here we camped for three nights.

A thunder-storm occurring during the first of these made us somewhat late (6.15) in getting under way for Mount Balfour on the morning of August 3. Our course to the ice lay plainly before us: first, a broad, rapidly ascending valley, strewn with large fragments of rock, and quite devoid of vegetation; beyond this, a rocky bluff around whose left and the stream descended by a rocky cañon. Over this barrier we could see the end of the glacier, and, at the top of the pass, a prominent pyramid of rock piercing it on the sky-line. We ascended the rocky bluff well to the right, and then skirted quite above the level-bottomed trench, which apparently at one time held a narrow lake, leading up to a point from which falling masses of ice from the still overhanging glacier must have fallen into it. Here again we took the right-hand gorge, and at 8.00 stood upon the glacier, at an altitude of 8150 feet. For a few hundred feet only the glacier is "dry" and slightly crevassed; beyond it is good névé to the top of the pass (8800 feet), which we reached forty minutes later, keeping to the left of the pyramidal rock. Here we spent half an hour breakfasting and photographing.

Mount Balfour was now in plain sight some four miles away in an air-line, but between us and it the névé-basin sagged deeply, and presented a maze of crevasses to one who should seek to cross it in a direct line. We therefore bore far to the right, making for the end of the long ridge on the continental divide, which attains an altitude of 10,250 feet, and to which we would gladly see the name "Mount Daly" ²

¹ The heights given are taken from a contour map of the valley made by the photographic method from four views taken from as many different summits. It illustrates E. Deville's work on "Photographic Surveying," of which the author has kindly sent me a copy since my return. I take pleasure in bearing witness to the excellence of this map of an unexplored valley.

² Mr. W. D. Wilcox, in his beautiful book, "Camping in the Canadian Rockies,"

applied. We reached its northerly foot at 9.55, and rested for fifteen minutes. Bearing now northerly, we made towards a remarkable rock exposure which here forms a striking feature of the continental divide, — a wall of rock, exposing its undulating belts of stratification, and with its crest weathered into a file of gendarmes. When near to it, we bore still more to the left, making directly towards the peak of Balfour, much foreshortened and seeming more remote than ever. The *névé* now gradually rose, and, although the snow was in excellent condition, the journeying over it grew very monotonous after four hours of such progress. Hence, after a lunch at about one o'clock, we turned again to the right to try our fortune on the rocky ridge which here formed the northerly bound of the long triangular snow-field we were traversing. Beyond its margin we found a most attractive level, from which a precipice fell to the surface of the glacier of the lower Bow lake, and which afforded a superb prospect. Here we tarried nearly half an hour.

The *arête* leading directly to the summit of Balfour forms in its lower part the western margin of the triangular *névé* already mentioned. The crossing to this proved the most arduous work of the day. The snow was soft, and Mr. Curtis sank nearly to his waist at every step, while great care had to be taken sounding for crevasses. Fully half an hour was spent in making about a quarter of a mile, and at its end on the farther "grat" Mr. Curtis declared himself "out of it;" nevertheless, he desired that I should press on with Campbell and reach the summit, possibly six hundred feet higher. We started at 3.45 in the hope of so doing.

Meantime the sky had quite clouded over and a violent hail-storm now set in. We started on, however, and descended to the bottom of a deep cleft which here interrupts the *arête*. The conditions were unfavorable to a reconnoissance, but the ascent of the steep face opposite, by its right-hand side, seemed by no means impossible; nor would it have proven so to a properly equipped party. But it was Campbell's first experience in such work, and while he developed excellent qualities in the days he climbed with us, at a point well up this rock face he lost heart, and further advance became for us impossible. What lay immediately before us was no more serious than what we had just done.

We left the *arête* at 4.40, returning about as we had come. The stretch over the bad snow took twenty-five minutes. At 6.30 we were at the foot of "Daly;" at 7.15 at the top of the pass, from which we descended on the eastern side of the pyramidal rock. We followed down the bottom of the narrow upper valley, and had a diffi-

gives the name "Mount Daly" to the peak called by us (following the maps of the Dominion Topographical Survey) Mount Balfour. I have endeavored to secure his approval of the transfer of the name to this vast summit ridge so plainly visible from the railway, but my letter was returned from the dead letter office.

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cult passage down the ugly little canyon leading from it. Camp was reached at 8.45.

On August 4 we made an ascent to the ridge bounding the valley on the east, the extension of the continental watershed south from "Mount Daly." We left camp at 9.30, and reached a secondary summit (9225 feet) at 2.00. The ascent offered at one point some very interesting practice in rock climbing. In general it was an easy ascent. A point some two hundred feet higher lies a half mile farther south, and is equally easy of access. The day was superb, and the views magnificent. Most interesting of all is the downward view on the eastern side of the Divide—perhaps five hundred feet sheer—to the Bath Glacier, which reaches possibly two miles farther south on that side than on the other, but is very much crevassed. Evidently the nearest distance from the railway to the ice would be by way of the basin lying almost due north of Wapta Lake. Judging, however, from the verticality of the eastern side of the range so far as we could see it, it would prove impossible to descend from the crest to the ice at that point. The bad crevasses would also make this a far less feasible line of approach to Mount Balfour than by the valley of Sherbrook Creek. The latter route is far shorter and of course easier than that by way of the Bow Valley.

On August 5 we broke camp at 7.40, proposing to explore some pretty "alps" that we had seen the day before on the heights to the west and northwest of our camp, and then return to Laggan. We found a most interesting grassy region at an elevation of between 7000 and 8000 feet, the ground being very much trampled by mountain goats. At 10.00 we were at a small glacial lakelet (8200 feet) lying at the base of an impressive cliff which forms the western side of the pass we had made two days previously. It is the eastern end of a series of peaks which hem in the great snow-field at its southern limit. The most characteristic feature of this peak is that it is surrounded on all sides by a sheer escarpment from three hundred to twelve hundred feet in height. Above the lakelet the crest clutches out in crags like great clumsy fingers. Fortunately a pile of rock fragments rendered it possible to reach the nick between the first two of these, which brought us above the escarpment on the southwestern slope. From this nick Campbell and I climbed down for some distance to flank the inaccessible rocks of the arête we had thus crossed, and then made our way by a series of steeply inclined névé slopes to the edge of the western arête, paralleling which we reached the summit at 12.10. The day was one of matchless clearness, and the view, including a long extent of the distant Selkirks, exceedingly fine. I secured a good series of photographs of the northern semicircle, including the valley of the North Fork and its ranges. We left the

summit at 12.45; reached the "nick" at 1.10, and the lakelet, by a glissade down a steep *névé* slope, at 1.25. At 6.30 we reached the railway and with our numerous traps boarded the slowly climbing eastbound overland train and so back to Laggan.

On August 8 Mr. Curtis and I, with a young man employed at the Chalet, as our third on the rope, made the first traverse of Abbot Pass. Mr. S. E. S. Allen came up to it from the west in 1894; I had, with others, several times made the ascent from Lake Louise to the same point.

We left the Chalet at 7.30, going by the trail to the upper end of the lake, which we reached at 8.00. We roped opposite the Couloir of Lefroy at 9.45, and reached the summit of the pass at 12.15. The crevasses of the upper portion of the ascent found in former years were closed, and the only other new feature was a tolerably vertical face of snow along which it became necessary to traverse.

We spent nearly two hours at the pass, starting down at 2. The steep scree at the top makes the early part of the descent tedious. Lower down we came to snow, and were glad to exchange our sliding for legitimate glissading. We reached the ice above Oesa Lake at 2.55; the lower end of the lake at 3.30; the cliffs overhanging the upper end of Lake O'Hara at 5.00, and the level of the lake at its lower end at 6.15. Mr. Allen's enthusiasm for the trip, manifested in his article in the *Alpine Journal* (No. 133), is fully justifiable. Taken as a whole, and in view of its infinite variety, I consider this the most extraordinary day's climb I ever made. After a momentary plunge in the icy waters of O'Hara, we started on, expecting to find a good trail and reach the railway at Hector that night. The trail, as so often hereabouts, proved a delusion, so we did better. We bivouacked in a soft, mossy dell in the timber at 9.30. Starting at 5.00 the next morning, we reached Hector at 8.15, in ample season to wash up before the arrival of "No. 1," by which we proceeded to Field, and one day later to Glacier House.

From Glacier House we made but one excursion, and that not in its principal features a new one. Leaving the hotel at 4.30, we ascended Glacier Crest; thence we continued along the southerly boundary of the Illicilliwaet glacier, finding excellent practice for every variety of climbing in our attempt to keep the ridge. Two o'clock found us lunching at the highest pinnacle visible from the hotel. Thence we moved southeasterly over the great ice dome which here crowns the ridge, and on to a minor summit overlooking the entire upper *névé* of the glacier. Our descent was by a steep *arête* towards the Asulkan valley, but breaking from it and bearing more towards Glacier Crest after we reached timber line. We struck the Asulkan Creek about three miles above the hotel, and then followed down the new and vastly improved trail.

Reports of the Councillors for the Autumn of 1898.

Improvements.

BY PARKER B. FIELD.

As the funds of the Club were needed this year in another direction, it became necessary to limit the appropriation for this department to about one half the usual amount, and consequently some paths which should have been repaired were of necessity slighted or entirely neglected. The majority of these were in the vicinity of Randolph, where, thanks to the public spirit of the summer residents, the Club paths are supplemented by many others, and are therefore of less importance than in other regions where our paths are the only means of access to the summits. It is hoped and urged that the appropriation for next year may be sufficient to put all these in good condition.

The work in this region was confined to the removal of some windfalls and placing of a few signs on the Air Line path and its branch to King's Ravine, and the renovation of the Madison hut and out-buildings. A new axe was placed in the hut.

An inspection of the path from Gorham over Mt. Moriah to Carter Dome revealed the fact that in many places the path is rendered impassable or entirely obliterated by the lumbering operations on Mt. Moriah; and as the logging is to continue, nothing has been done. From Mt. Moriah to Carter Dome the path was found in fair condition, obstructed only by an occasional windfall; but as this path is of little use until an outlet to Gorham can be made, it was not repaired. The Imp camp is in good condition, except for a slight leak in the roof.

Continuing over Carter Dome and on to Jackson, the path was found to be very badly obstructed by windfalls, the observatory on Carter Dome demolished, and the camp in the Notch in a most dilapidated state. As the lower part of the path to Jackson has been extremely wet of late years, it seemed wise to relocate it. The hotel proprietors in Jackson met most cordially the suggestion of the Councillor that they contribute the funds with which to cut a new path and repair the old one to Carter Dome, and build a camp in the Notch and an observatory on the Dome, and with the fund raised in this way it has been

possible to make these improvements. The new path turns to the left from the old one shortly after the first brook is crossed, and, following an abandoned logging road on the side of Mt. Wildcat, runs into the old path some distance below the spring. The path is quite dry and well supplied with guide-boards. In the Notch a new shelter camp, which will accommodate seven persons, has been built on the shore of the lake and close beside a cold stream which descends from Carter Dome. It commands a superb view across the lake to the ledges on Mt. Wildcat. The observatory on the Dome is fifteen feet high, and of the same type as the old one. The work was done by J. G. Davis, of Jackson.

The path from Carter Notch down Nineteen Mile Brook to the Glen has been roughly cleared by T. S. Lowe, of Randolph, and many guide-boards have been placed upon it. More bushing should be done here next season, and it may become necessary to prop or rebuild some bridges.

The Club is responsible for the so-called Tuckerman's Ravine path, which leads up from the Glen via the Crystal Cascade until it ends at the Raymond path below the Hermit Lakes. This was cleared by T. S. Lowe.

The Mt. Carrigain path has been well cleaned out by James Chase, of Bartlett. A portion of it was relocated, and the entire route from Livermore well marked with guide-boards. The relocated portion turns from the old path sharply to the left at the lumber camp, and, running steeply up the unsightly clearing, soon meets the old path below the spring. The change was rendered necessary, as lumbering operations had seriously obstructed the original and longer path.

The charm of the walk on the Livermore-Waterville path, between Livermore and the foot of Mt. Kankamagus, has principally disappeared before the axeman, and the most available route as far as Camp 6 is now on the lumber railroad. A short portion of the path beyond the camp has been relocated, and the path has been put in good order through to Waterville by James Chase, of Bartlett, as far as the height of land, and by the workmen of Mrs. S. B. Elliott from the watershed through to her house. Mrs. Elliott's men have also cleared the Waterville path to the summit of Black Mountain (Sandwich Dome).

During the year \$154.85 have been spent in this department, \$34.00 of which were raised by special contribution among the Jackson hotel proprietors.

In addition to the work done under the direction of the Councillor and paid for by the Club, several persons have unselfishly worked upon the Club paths and on those of their own making, for the common good, and should be recognized as our benefactors. In Randolph should be mentioned Mr. William G. Nowell, who has cleared many Club paths, in the vicinity of his log cabin on Mt. Adams; Messrs. W. H. Peek and E. B. Cook, for years co-workers in the cause; and Mr. J. R. Edmands, whose superb woodland highways for the walker claim the admiration of all. From Mr. James Sturgis Pray comes the report that, with funds furnished by interested friends and himself, he has had a good path cut up the north side of Mt. Chocorua from Swift River Intervale. The path starts from just below James Allen's (about three and a half miles east of Shackford's), and follows the route of the old path to Champney Falls, which has been cleared and improved. From the falls the path proceeds through the Champney Ravine, and eventually runs into the Piper path on the ledges below the peak. The ledges are marked with white paint. Mr. Pray wishes the path to be known as the Champney Falls path.

During the winter Mr. Gordon H. Taylor did excellent work in blazing some snow-shoe trails in the vicinity of Birch Intervale, Tamworth. An easy and direct one was blazed from the Passaconaway path below Dicey's Mills, over the southerly ridge of Mt. Whiteface to its summit. He also blazed a trail to "The Caves" in the col between Mts. Wanalancett and Paugus, and from there to the summit of Paugus. A deep vista was also cut by him, that a fine view of Square Ledge might be had.

The record cylinders have been maintained as in the past, and several of the rolls have been filled and replaced by new ones.

Report of the Room Committee for 1898.

THE pleasure and satisfaction with which the members regard the new rooms of the Club have in no wise abated during this, the second year of our occupancy, and it is pleasant to realize that it is becoming customary to bring visiting friends to the rooms to admire the view and the sunsets, and to look over the treasures of the library. The rooms have been open week-days during the year, a vacation in the summer excepted, and even this was shortened by the reopening of the rooms during the visit of the American Association for the Advancement of Science. Volunteer custodians have always been ready and willing to take charge for an afternoon or two each month. The rooms are steadily gaining in popularity, and visitors have recorded their names during the year to the number of about 5500. This is not the full record, for many come and go without noticing the register. Members have made use of the rooms on about 325 days, some even finding them a pleasant place in which to rest a while on Sunday.

During the year, "at homes" have been held on the same plan as last year, usually by the Room Committee. On May 16, President and Mrs. Niles, desiring to become better acquainted with the members personally, received in the rooms during the afternoon and evening. These social occasions, which supply a needed feature hitherto lacking in our Club life, are very popular. As the "motif," a collection of photographs, paintings, or other items of interest in an alpine or geographical way is disposed about the rooms. This exhibition remains in place during the week following the "at home" for the benefit of any who cannot attend on that particular day. Several hundred visitors usually view the exhibition, and the number has been in one instance almost one thousand in the week.

The rooms have afforded a convenient meeting place for the Council of the Club and its various committees having care of excursions, publications, membership, nominations and the annual reception, and it is estimated that not less than one hundred such meetings have been held in the year. The regular sections of the Club, including the snow-shoers and the bicyclers, have assembled in the rooms for their annual and business meetings, finding the larger of the rooms admirably adapted to this use. The reunions of different excursions also have been held in the rooms, and the Waterville trip, and those to the Adirondacks and to Dixville and Rangeley, have been represented by such occasions.

A novel feature which has grown into prominence since the Club has occupied its present quarters is the "folding-bee." On the Friday afternoon preceding the meeting, the rather uninteresting work of folding and enclosing the notices of the coming meeting is to be done. Of course the help of a mailing agency could be secured, but, with a desire and at times a necessity of affording the maximum of time to the preparation of the circular, it is necessary that the mailing of them be certainly and promptly done. Vol-

untary helpers to the number of twenty or thirty assemble in the rooms and assist in the work, many hands making it light, and at the same time a pleasant informal reunion is afforded.

During the meeting in August of the American Association for the Advancement of Science, the use of the Club rooms was tendered to the Association by the Council for a down-town headquarters, and the same courtesy was offered to the affiliated societies. Many distinguished visitors viewed the rooms during the week, and many of them found interesting features for study in the library with its maps and the collection of photographs.

The use of the rooms has also been permitted to other associations in which our members have been interested, which were at the time not sufficiently strong to have quarters of their own. The early meetings of the Mycological Society were held in our larger room, and, until the society became so large that the room could not accommodate them, they continued to meet there. The Massachusetts Forestry Association also has held its meetings in our larger room.

The increased burden which the new rooms have put upon the treasury of the Club have made it inexpedient for the Room Committee to purchase other than the most utilitarian furnishings for the rooms. These have been as decorative as the limited sums expended upon them have permitted. Unobtrusive book-shelves have spread out over the walls of the library room, keeping pace with the growth in number of our books, and some minor items have served to brighten and make more pleasant the interior furnishings. But the larger needed items have been out of the question.

In an unexpected way, the Club has been the recipient of gifts of a substantial nature. The Field Study Section, finding it inexpedient to continue longer a section of the Club, and having in its treasury an unexpended balance, has, with the consent of its former members, given to the Club, as a token of good-will, a fine centre-table in oak for the reception-room. As a fitting accompaniment, President Niles has himself given a beautiful rug, of a pattern and coloring pleasing to the eye, which by its greater size covers much of the vacant floor space exposed by the one it replaces.

Report of the Excursion Committee for 1898.

DURING the year there have been seven excursions, with an average of fifty-two members attending each, and thirty-nine outings, with an average attendance of thirty-four. The total number of participants was 1698, not so large as last year. The falling off is no doubt due to the great number of threatening or stormy Saturdays, when but few cared to take the outings, hence many were given up.

The all-day and half-day outings have been in charge of a sub-committee of three, and the arrangement appears to have been a most satisfactory one.

EXCURSIONS.

The winter excursion was, as usual, arranged by the Snow-Shoe Section, and led by its chairman, Mr. R. B. Lawrence, and its secretary, Mr. W. R. Davis. On February 19, forty-six members of the Section went to Elliott's Hotel, in WATERVILLE, N. H., and were later joined by others until the number reached fifty-one. Owing to an almost continuous snow-storm during the week at Waterville, the various trips up the mountains were not made by large parties, and no views were obtainable from the summits. Nevertheless all the available time for snow-shoeing was well used, and parties visited the summits of Tecumseh, Osceola, Black Mountain (Sandwich Dome), and North Tripyramid; and after the main party had returned home, South Tripyramid was also ascended by eight persons. The shoeing on four feet of snow was excellent, and was greatly enjoyed by all.

The HOOSAC TUNNEL region was visited on Memorial Day by a party of eighteen, in charge of Mr. John Ritchie, Jr., and was well cared for at Rice's Inn. The morning of Friday, May 28, was occupied in journeying to the Tunnel Station, and in the afternoon the twin waterfalls were visited. The frequency of rain during the season made them particularly beautiful. On Saturday, May 29, a party of twelve started for the summit of GREYLOCK, intending to walk up through the Hopper. Clouds and rain overtook this party when on one of the minor peaks of the range, and it was deemed more prudent to return by the same route from that point. Three others drove to the summit, but much of the way in dense fog. On Sunday an informal walk was taken at random along the brooks of Hoosac Mountain, and in the afternoon a ride was in order to Heath, a little-visited town on the hill-tops. On Monday, Decoration Day, the entire party went by special train to Wilmington, Vt., through the picturesque gorge of the Deerfield River, and five made the ascent of HAYSTACK. This was the first Club party to visit this interesting peak, which is one of the distant points said to be visible from Mount Washington. On Tuesday the party enjoyed a ride along the ridges of Hoosac Mountain, returning on Wednesday to Boston.

On June 17, a party of twenty-one, conducted by Mr. Albert S. Parsons, visited WARWICK, MASS., and was introduced to the tract of land, including a peak of Mt. Grace, which has recently been presented to the Club by Mr. Parsons and others. Twenty-three persons ascended this mountain in the afternoon, over a well-defined and easy path, to the highest summit (1620 feet), Mr. Gardner M. Jones guiding the party. The day was perfect, the air clear, and the views extensive. The wild strawberries were plenty and sweet.

The highest peak of Mt. Grace is wooded, but, through vistas cut by the State Survey for the purpose, Mounts Greylock, Tom, Holyoke, Tobey, Crag, and Haystack were visible. A huge granite boulder rests on the exact top of the mountain. The walk was soon continued to the northeast

peak (1490 feet), which is the centre of the forty acres owned by the Club. This is clear of woods or brush, and commands a much more beautiful view. Monadnock rises in grand proportions to the northeast. Ascutney, Equinox, Haystack, Stratton, and other southern Vermont mountains are seen to the north and northwest, with a glimpse of Connecticut River. Southern Kearsarge is plainly seen, while due north runs "Sunny Valley" to Winchester, N. H., a charming picture. Wachusett, with several ponds and pretty villages, make up the eastward view. The Club's real estate was inspected, part of it being wooded with pines and chestnuts. A ledge containing radiated tourmaline is one of the features of the spot, but owing to lack of implements no good specimens were secured. A Blue Hill box-kite was sent up for lack of flag or pole. The party made the easy descent directly to the hotel, through a wood road, under fine chestnut trees. This road is a comfortable walk to "our peak" for any person capable of walking a few miles.

On the following day, seventeen of the party drove to the picturesque Royalston Falls, and were shown some very interesting results of erosion. On the next day, sixteen drove to Northfield, and visited the D. L. Moody schools. During the stay in Warwick, papers were read by Mr. F. V. Fuller and Dr. Lewis G. Janes.

The thirty-third Field Meeting of the Club at St. Hubert's Inn and at other places in the ADIRONDACKS proved to be one of the most largely attended excursions in the Club's history. One hundred and thirty members and their friends were with the party, which at Lake Placid, a week later, still numbered more than one hundred, and, at Au Sable Chasm, seventy-five. The committee in charge were Messrs. John Ritchie, Jr., Charles E. Lord, and George D. Newcomb, and Miss Sarah N. Macomber.

The party left Boston by the regular train to Burlington on Friday, July 1, arriving at Westport at about 9 P. M. The next day was devoted to the long carriage ride through Elizabethtown to St. Hubert's, where comfortable though rather crowded accommodations were found. The committee was particularly fortunate in that Mr. E. I. H. Howell, of Philadelphia, the head and front of the two Adirondack improvement associations, was able to be with the Club during its stay. Knowing the country thoroughly, he was able to plan many delightful walks, strolls, and scrambles, and, through his relations to the Reserve and its resident officials, he was able to secure many courtesies to Club members. Mr. S. Burns Weston, also of Philadelphia, gave freely of his time, led walks, and afforded the party the novelty of an evening around an Adirondack camp-fire.

Saturday afternoon was devoted to settling in the new headquarters. On July 3, an informal party of seventeen, with Mr. Howell as leader, strolled into the Reserve, taking for a short distance the trail to the Gothics, and returning by the River Trail, enjoying the delightful cascades of the Au Sable. Another party of eleven ascended Noonmark.

On Monday, July 4, two all-day trips were taken. The smaller party

of ten made the long, hard tramp to the summit of Mt. Dix, while some forty-seven climbed Noonmark, lunching on the summit to the unusual accompaniment of ice-water. Few of the mountains in this vicinity have springs near the summit, and the dry season of the early summer made this peculiarity the more marked. It occurred to the committee that water in its solid form is as easy to carry as the liquid, and the outcome of the experiment was in every way satisfactory.

Monday evening there was a session for the reading of papers, President Niles in the chair. The details of this and a later meeting are appended to "Proceedings of the Club" (see p. 113).

On Tuesday, July 5, a party of four, under the leadership of Professor H. C. Parker, made the Crest Walk, from the Gothics to the summit of Marcy, sleeping overnight at the Marcy Camp, and reaching St. Hubert's again the next afternoon. In company with this party, a larger one — thirty-seven in number — left the hotel for the summit of the Gothics. In the morning another party of fifty, forty of whom were walkers, went by wood-roads and paths to Chapel Pond and Fern Caves, returning to the hotel in time for dinner. Mr. Howell was leader. A few more ambitious walkers returned from the pond by the way of the Giant's Washbowl, and thence down over the Giant Trail, in company with Mr. Weston.

For Wednesday a complicated programme was arranged. About one hundred and twenty persons left the hotel, some in carriages and others on foot, to picnic at the Lower Au Sable Lake. At the lake, ample time was allowed to permit of visits to all the places of interest along its shores, and some even made the carry to the Upper Lake. All visited Rainbow Falls, which showed themselves in a way to thoroughly justify the name. After luncheon the larger portion of the party returned to the hotel over Indian Face and the Gill Brook Trail. Some forty-seven, together with fourteen guides, made their way to the Upper Lake, where they spent the night in the camps. This is the largest party to have enjoyed at one time the delightful scenery of this beautiful lake.

Of those who were in camp on Thursday morning, twenty-seven set out at an early hour for the summit of Marcy over the trail from the head of the Upper Lake, returning in the afternoon by the new trail leading to the foot of the same. Twenty of those who did not go to camp visited Cathedral Rocks on Thursday. In the evening a second session was held for the reading of papers.

For Friday no regular programme was laid out, excepting a "consolation camp" by day on the Upper Lake for those who could not be accommodated on Wednesday night. Nineteen availed themselves of this opportunity. In the evening, on the invitation of Mr. and Mrs. Weston, the party assembled at their sojourning place about half a mile from St. Hubert's Inn, a spacious Adirondack camp, with numerous rustic seats and settees surrounding a huge crib fire, and furnishing seats for even so large a party as this, and until late in the evening the company enjoyed itself with songs, stories, sallies, and speeches. This was one of the striking novelties of the meeting, an occasion in which every one joined for the benefit of the whole.

On Saturday morning the company divided into three parties, one to return directly to Boston, one to stop for two or three days at Au Sable Chasm, and the third, the largest one, to pass Sunday at Lake Placid. A mid-day rest and luncheon at Cascade Lakes served to break the long carriage ride, and by nightfall the party was comfortably settled in the Stevens House. On Sunday an informal party of twenty-one made the ascent of Whiteface, the day being a good one, with clear distant views, and quite a number walked to Mount Whitney. On Monday the regular ascent of Whiteface was made by thirteen, while others rode to Wilmington Notch, Adirondack Lodge, and to other places of interest in the neighborhood. On Tuesday morning, July 12, the regular party, numbering about seventy-five, left Lake Placid via the Chateaugay Railroad for Au Sable Chasm. Other small parties made tours more or less extended through the Adirondack lakes. The Au Sable Chasm party reached its destination in time for dinner, and spent the afternoon in the Chasm. Leaving the hotel on Wednesday morning, Boston was reached late in the afternoon.

A camping party was, as usual, planned for August, and, under the management of Messrs. Harvey N. Shepard, Alvin R. Bailey, and Selwyn B. Clark, the two weeks from July 30 to August 13 were spent on LAKE WINNEPESAUKEE, twenty-one persons participating.

The camp was situated at the edge of a fine grove of trees upon the west shore of Moultonboro' Bay, with the house-boat Iris as an important auxiliary. The majority of the party slept in tents, though some availed themselves of the state-rooms on the house-boat. The table was cared for by Mr. W. L. Chaloner, and was most satisfactory in every respect. At the water's edge, in front of the camp, was a fine sandy beach of gentle slope, admitting of safe and excellent bathing. The use of the house-boat was much appreciated, and enabled the party to explore every portion of the lake, and to make excursions readily and without inconvenience. Drawing only a little water, this boat could go into many portions of the lake not often visited by tourists. The rain, of which there was quite a little, fell principally in the night, and caused but slight inconvenience in the execution of plans. One of the most enjoyable excursions was to Wolfborough, and thence across Lake Wentworth to the camp of Mr. T. E. Parker, where he with his wife and guests gave to the party a most cordial welcome. A moonlight drive in a hay-rack the length of Long Island was enjoyed by all. One day was spent on a drive from the quaint and interesting town of Melvin, upon the opposite shore of Moultonboro Bay, to Ossipee Mountain Park, while a portion of the party, under the leadership of Mr. Bailey, climbed Mount Shaw. Another day was spent most delightfully in the ascent of Mount Belknap. An afternoon was devoted to Red Hill. With row-boats Shannon Brook was ascended, and the party greatly enjoyed its charming environment, as picturesque as can be found in any part of New England. Another trip, twice taken, was to Green's Basin, at the upper end of Moultonboro Bay, with its group of fascinating islands and heavily wooded shores.

From September 2 to 7 (including Labor Day), a party of thirty-one visited CAMDEN, ME., under the leadership of Mr. Parker B. Field.

The sail to Camden on the Bangor steamer was calm and uneventful.

Upon the morning of arrival, Saturday, a party of seventeen climbed Mt. Battie, and enjoyed a clear view from the summit. After luncheon, twenty-eight of the party took the drive around Ragged Mountain, passing Mirror Lake and Grassy and Hosmer ponds.

On Sunday, twenty-nine took the steamer Catharine, chartered for the occasion, and sailed through Fox Island Thoroughfare and Eagle Island Passage to Cape Rosier and Castine. Fine weather prevailed until Cape Rosier was reached, when a fog shut down on Penobscot Bay. George H. Witherle, Esq., of Castine, met the party at that place and escorted them about the town in buck-boards, and, in spite of the heavy fog, the trip was much enjoyed. Return was made to Camden in the fog.

In the evening Hon. Mellen Chamberlain spoke to the party on "Nature: its Influence on Life and Literature."

Monday proved a beautiful day, and twenty-nine drove over the famous Turnpike to the Wadsworth place, from which twenty-four ascended Maiden Cliff. After a pleasant half-hour spent on the Cliff, eight persons returned to the carriages, and drove home to luncheon, while sixteen continued over the length of the range to Mt. Megunticook, and descended into Camden in the afternoon.

In the evening Hon. T. R. Simonton, of Camden, spoke to the party about the geology, Indian traditions, and history of Camden.

On Tuesday, thirty drove to "Lake City," and spent two hours in a delightful cruise in a steam launch, on Lake Megunticook, and, returning to the carriages, all drove completely around the lake and mountain, arriving at home in time to enjoy a late dinner before taking the return boat to Boston. The return passage was over a calm sea, under the full moon.

Headquarters during the stay were made at the Mountain View House, and the magnificent prospect of bay and mountains, as well as the excellent table and hospitable attention of the landlord, Mr. F. O. Martin, were appreciated by all. The livery service of Mr. S. H. Freeman was exceptionally good.

The fall excursion to DIXVILLE NOTCH and RANGELEY LAKES was the largest that the Club has ever taken at that season of the year, the number participating being eighty-six. The committee in charge of the trip consisted of Messrs. George D. Newcomb and John Ritchie, Jr., the former taking especial care of the party at Dixville, and the latter assuming leadership through the lakes.

The party left Boston on the afternoon of Friday, September 23, passing the night at the Crawford House, White Mountains. The next day at noon a special train conveyed them to Colebrook, where carriages were in waiting to complete the trip to The Balsams at Dixville. The weather during the stay at the Notch was only fairly good, rain at Crawford's interfering with proposed trips in the vicinity on Saturday morning, and

the ride from Colebrook to the Notch being made through light showers. A steady rain on one of the days of the next week prevented all trips.

During the stay the party took many walks to interesting places, and these were attended by considerable numbers. Table Rock, through the woods to the Profile, up Sanguinari and down the slide, up and down Polmageni, to the summit of the southern Dixville Peak, with minor walks to the Flume, the Cascades, and to Little Round Top, were among those which were well attended.

On Wednesday, September 28, the whole party drove through the Notch to Errol, taking steamer on the Androscoggin to the Magalloway, and up this charming stream for four or five miles.

Saturday evening, September 24, and Friday evening, September 30, were devoted to meetings, at which President W. H. Niles occupied the chair, accounts of which will appear in connection with the Recording Secretary's report. On other evenings, social entertainments and parties were in order.

On Saturday morning, October 1, half of the party returned to Boston via Plymouth.

The Rangeley party, thirty-two in number, left The Balsams on Saturday morning for Errol Dam and Lake Umbagog, crossing the lake in a special steamer. Landing was made at Sunday Cove, and nearly all walked over the five-mile carry, arriving at Angler's Retreat in time for a late dinner. The evening was devoted to a moonlight sail to South Arm. The party remained at Angler's Retreat till Monday morning.

On Sunday, informal parties visited Sunday Pond and the Richardson Ponds, and on Monday the headquarters were changed to The Birches on Student Island, Lake Mooselucmeguntic.

Tuesday was devoted to Cupsuptic Lake, the party returning to The Birches for the night, and on Wednesday morning a move was made to the Mountain View House on Rangeley Lake. Some of the party reached this place by walking over Bald Mountain, and a small party made the ascent on Thursday morning, on which day the party returned to Boston.

OUTINGS.

The Sub-Committee on Outings, consisting of Messrs. John Ritchie, Jr., and George D. Newcomb, and Mrs. George H. Adams, report as follows:—

The arrangements of the Outing Committee included quite a complicated programme, having on the same day, on three occasions, an all-day outing and one for the afternoon, the two parties meeting at some convenient point and finishing the walk together, and one other day with two outings planned to go to different places. Other outings were so arranged as to permit the Bicycle Section to spend some portion of its meet in company with the walkers. Individual outings of the year equal or exceed, in number attending them, those of any previous year. The harbor excursion of June 17 numbered one hundred and seventy-eight; and the trip to Magnolia and Norman's Woe on April 19, one hundred and fifty. Some of the afternoon outings were very large, that which went to see the Blue Hill kite-flying on September 10 including one hundred members and friends, the

trip to Waverley Oaks on November 12 numbering seventy, and the Wild Cat Ledge party of April 2 numbering sixty. The union of the two parties of May 21 at the foot of Hancock, in the Blue Hills, brought together seventy-three, who finished the day together, and the two parties at Hemlock Hill in Canton numbered fifty-eight. The total number, thirteen hundred and forty, for the year on the outings was not so large as in some previous years, for the reason that many Saturdays in the most popular season for walking were rainy, and during other seasons the weather was exceedingly hot.

Altogether, fifty-two outings were planned by the committee, but two of those planned for all day were given up on account of rain, as well as eleven of the afternoon outings.

Herewith is a list of the successful outings, chronologically arranged, with objective points, the names of the leaders, and the attendance:—

1898.			
Jan. 1	Blue Hills,	Mr. Field,	8
8	Castle Rock,	Mr. Burrill,	17
22	Old Canal,	Mr. Osborn,	14
29	Hammond Pond,	Mr. Newcomb,	17
Feb. 5	Reeves Hill,	Mr. Field,	17
19	Muddy Pond,	Mr. Newcomb,	8
26	Fort Rock,	Mr. Chamberlain,	26
Mar. 5	Spot Pond,	Mr. Cades,	11
12	Wild Cat Ledge,	Mr. Newcomb,	5
26	Pine Hill,	Mr. Forbush,	25
Apr. 2	Wild Cat Ledge,	Mr. Ritchie,	60
9	Wampatuck's Outlook,	Mr. Bates,	42
16	Eliot Circle,	Mr. Fuller,	18
19 (all-day)	Norman's Woe,	Messrs. Mackintosh and Newcomb.	150
30	Marsh Marigolds,	Mr. Field,	27
May 7 (all-day)	Reservoir Pond and Hemlock Hill,	Miss E. Endicott,	31
7	Afternoon to same,	Mr. Newcomb,	27
14	Bear Hill,	Mr. Lynde,	31
21 (all-day)	Blue Hill Range,	Mr. Ritchie,	23
21	Afternoon to Blue Hill,	Mr. Newcomb,	50
28	Maugus Hill,	Mr. Chamberlain,	18
30 (all-day)	Moose Hill,	Mr. Merriam,	40
June 11	Neponset River Bank,	Miss Lanning,	40
17 (all-day)	Baker's Island,	Mr. Newcomb,	178
18	Bartholomew's Pond,	Messrs. Newcomb and Ritchie,	27
25	West Roxbury,	Mrs. Witherell,	35
Sept. 3 (all-day)	Pegan Hill,	Messrs. Norton and Crosby,	6
10	Blue Hill,	Mr. Ritchie,	100
17	Pine Hill,	Mr. Lawrence,	50

Oct. 1	Bellevue Hill,	Mr. Crosby,	20
8	Wolf Pits,	Mr. Bailey,	9
Nov. 5	Prospect Hill,	Mr. Fuller,	21
8 (all-day)	Peabody Boulders,	Messrs. Chubbuck and Ritchie,	32
12	Waverley Oaks,	Mr. Field,	70
26	Auburndale Kame,	Mr. Newcomb,	23
Dec. 3	Middlesex Fells,	Mr. Lynde,	19
10	Prospect Hill,	Mr. Ritchie,	18
17	Lexington,	Mr. Parsons,	15
24	Lynn Woods,	Mr. Bailey,	12
			<hr/>
Total,			1340

A. A. A. S. EXCURSIONS.

As one of the hosts of the American Association for the Advancement of Science during its visit to Boston from August 22 to 27, the Club has had the honor of planning and conducting all of the excursions of that body.

The excursions were under the general charge of the Chairman of the Excursion Committee, and the various trips were led by different Club members.

About nine hundred members of the Association were in attendance at the meeting, and two or three simultaneous excursions were usually planned, in order to prevent overcrowding of any one.

The excursions were as follows: —

Number participating.		Leaders.
<i>Tuesday, August 23.</i>		
93	{ Middlesex Fells, by train,	Messrs. A. R. Bailey and R. B. Lawrence.
	{ " " by bicycle,	Mr. E. A. Start.
325	Boston harbor,	Mr. G. D. Newcomb.
<i>Wednesday, August 24.</i>		
525	Salem,	Messrs. John Ritchie, Jr., and Parker B. Field.
20	Metropolitan Water Works, Oakdale and Fayville,	Mr. Desmond Fitzgerald.
<i>Thursday, August 25.</i>		
150	Reception by Governor Wolcott and visit to Blue Hill Observatory,	Messrs. Rosewell B. Lawrence and J. Allen Crosby.
350	{ Drive through the Park System and reception at the Country Club by Mrs. J. L. Gardner,	Mr. Fred V. Fuller.
	{ Bicycle Ride through Park System,	Mr. E. A. Pope.
28	Revere Beach Reservation,	Mr. Parker B. Field.

Friday, August 26.

800 Cambridge Day, spent at Harvard University.

Saturday, August 27.

34	Visit to Concord,	Mr. George D. Newcomb.
36	Visit to Lexington,	Mr. Fred V. Fuller.
21	Visit to Concord and Lexington, by wheel,	Mr. A. S. Parsons.
189	Visit to Wellesley College and Riverside Recreation Grounds,	Mr. C. L. Burrill.

Monday, August 29.

Trips to Plymouth and Provincetown were arranged, but were not personally conducted.

All arrangements for bicycles during the visit of the Association were in charge of Mr. Albert S. Parsons.

On Monday, August 29, a party of forty-two, including four members of the A. M. C., who acted as hosts, started for the White Mountains, arriving that night at the Profile House.

During the day, spent in Franconia Notch, parties visited the Flume, Pool, and Basin, also Mt. Lafayette, and Cannon and Bald Mountains.

Leaving the Profile House on Wednesday morning, the summit of Mt. Washington was reached before dinner, and in the afternoon the parties visited the Alpine Garden and Tuckerman's Ravine.

On the summit of Mt. Washington, in the evening, Professor George H. Barton gave a most interesting talk upon the geology of the White Mountain region.

On Thursday the main party proceeded by train to the Crawford House, while fifteen walked there by the old bridle-path. From here parties visited the various cascades, Elephant Head, and the summit of Mt. Willard.

The party returned to Boston on Friday.

The committee for this trip consisted of Messrs. Parker B. Field, Rosewell B. Lawrence, George H. Barton, and Harvey N. Shepard.

The total attendance on the various A. A. A. S. excursions was 2613.

The last Excursion Committee reported a balance of \$54.46 on hand, and railroad tickets to the value of \$49.63. We have turned over to the Treasurer of the Club \$80.00, and now report \$57.40 cash on hand, and \$44.99 in railroad tickets.

PARKER B. FIELD,
JOHN RITCHIE, JR.,
GEORGE D. NEWCOMB,
CHARLES E. LORD,
SARAH MACOMBER ADAMS,
CHARLES L. BURRILL,
JAMES STURGIS PRAY,
Committee on Field Meetings and Excursions.

Proceedings of the Club.

March 9, 1898. — One Hundred and Eighty-first Corporate Meeting.

President Niles in the chair.

One hundred and five persons were present. The records of the last meeting were read and approved.

The resignation of Mr. I. Y. Chubbuck as Trustee of the Permanent and Reserve Funds was tendered, in order that a mistake made at the annual election might be corrected. The resignation was accepted. The following were then elected Trustees of the Permanent and Reserve Funds: For two years, Isaac Y. Chubbuck ; for three years, Rest F. Curtis. Sixteen candidates for membership were elected.

"Our Contemporary Ancestors in the Southern Appalachians" was the subject of the evening, and the speakers were Rev. William G. Frost, Ph. D., President of Berea College, Kentucky, and Rev. William E. Barton, D. D., of Boston. President Frost described the mountain region of eastern Kentucky, the ridges and valleys of the Cumberland plateau, and the consequent lack of communication. He then showed how this isolation had retarded the development of the people, so that their present civilization really belongs to the last century. The strong characteristics of the inhabitants, people of English and Scotch-Irish descent, — their vigor and self-reliance, independence, and patriotism, — were illustrated by many short anecdotes.

Dr. Barton spoke especially concerning the opposition of these people to slavery, and the important part which they took in the war of the Rebellion.

President Frost showed twenty-four lantern-slides, and upon request described the work which Berea College is doing to educate and elevate these mountain people.

April 4, 1898. — One Hundred and Eighty-second Corporate Meeting.

President Niles in the chair.

One hundred and seventy-five persons were present. The records of the last meeting were read and approved. Fourteen candidates for corporate membership were elected, and Mr. John Muir of San Francisco, Mr. Joseph Vallot of Paris and Chamounix, and Prince Luigi Amadeo of Savoy were elected Corresponding Members.

Rev. Henry G. Spaulding gave an illustrated lecture, "The Island of Capri." Beginning with a map of the Bay of Naples, a view of Vesuvius as it appeared 2000 years ago, the Greek Temple at Pæstum, and the cliffs of Amalfi, the speaker then showed a large number of views illustrating the scenery of the island of Capri, its cliffs and mountains, the landing-place, the towns of Capri and Ana-Capri, the interesting people, and finally the wonderful Blue Grotto. Numerous historical allusions increased the interest of the lecture, and many of the lantern views were colored.

April 21, 1898. — Special Meeting.

President Niles in the chair.

This meeting was held in Upper Horticultural Hall, by coöperation of the Massachusetts Horticultural Society and the Appalachian Mountain Club. About four hundred persons were present, the members of both societies, with their friends, being invited. General Francis H. Appleton, President of the Horticultural Society, called the meeting to order, welcomed the Club, and introduced its President. President Niles expressed gratification at the coöperation of the societies, and then introduced the speaker, Mr. Cornelius Van Brunt of New York, who gave a lecture, illustrated with colored lantern-slides, on "Wild Flowers of the Canadian Rockies amidst their Native Surroundings." The scenery around Banff, Lakes Louise and Agnes, and the Glacier House was illustrated with superb photographs of peaks, glaciers, and lakes, but even more remarkable were the exquisitely colored views of the wild flowers. Several scores of specimens were shown, in masses, in clusters, and in single flowers. The pictures were shown upon a black background with electric light, and the beautiful petals were luminous as with sunlight.

May 11, 1898. — One Hundred and Eighty-third Corporate Meeting.

Vice-President Curtis in the chair.

One hundred and ten persons were present. The records of the last meeting were read and approved. Eighteen candidates for membership were elected.

The Chairman explained the measures taken by the Council toward securing the preservation of forests in the Northwest, and read the circular sent to members of Congress.

Several short papers were presented describing the various trips taken during the recent snow-shoe "meet" at Waterville, N. H. Mr. R. B. Lawrence opened with a few statistics and general remarks. Then followed Miss M. A. J. Frothingham on the subject, "In the Woods and on the River;" Mr. Gorham Dana, on "Sandwich Dome;" Mr. W. L. Chaloner, on "Mt. Tecumseh and Frostwork;" Mrs. W. R. Davis, on "Mt. Osceola;" Mr. Frederic Endicott, on "Prospecting;" Miss S. N. Macomber, "In-doors;" and Mr. P. B. Field, on "North Tripyramid." Stereopticon views were shown, the slides being made by Messrs. Field, Endicott, and Dana from their own negatives.

June 8, 1898. — One Hundred and Eighty-fourth Corporate Meeting.

President Niles in the chair.

About seventy persons were present. The records of the last meeting were read and approved. Thirteen candidates for membership were elected.

The President called attention to the exhibit of the Lowell School of Design, hanging upon the walls.

Mr. Arthur T. Hopkins addressed the Club concerning "The Island of Jamaica." He described the topography of the island, with its mountain ranges and rapid rivers, the people and their customs, the vegetation, and the banana industry. He also explained his professional work in connection with water-supply and sewerage problems. A large number of lantern views were shown.

Mr. Frank O. Carpenter gave a paper on "The Lost River." (See p. 37.) This interesting phenomenon is in the gorge on the north fork of the Moosilauke stream, near North Woodstock, N. H.

July 1 to 12, 1898. — Thirty-third Field Meeting. Held at St. Hubert's Inn, Adirondacks, N. Y.

President Niles in the chair.

Two meetings for the presentation of papers were held in the parlor of St. Hubert's Inn.

On Monday evening, July 4, about 120 persons were present. The meeting opened with a piano solo by Miss C. M. Endicott.

Mr. Edward I. H. Howell, of Philadelphia, addressed the Club on the "Preservation of Forests in Europe and America." He alluded briefly to the arguments in favor of such preservation, and the measures already taken by the State of New York in the Adirondacks, by the general government in the West, and by the Appalachian Mountain Club in New England. He then spoke concerning the preservation of game, the animals already exterminated, and the great need of protection. The large forest and game reservations in the Adirondacks were mentioned, and the excellent work of the Adirondack Mountain Reserve in the protection of fish and game, in the preservation of forests, and in the cutting of paths, was explained at some length.

A soprano solo by Miss S. Saunderson followed the address of Mr. Howell.

Professor J. W. Chickering, of Washington, D. C., then spoke concerning "The Flora of the Mountains," making comparisons with the White Mountains, and alluding to specimens found on the walks during the Field Meeting.

The meeting closed with the singing of "America" by the audience.

The second meeting was held Thursday evening, July 7. About one hundred persons were present.

After a musical selection on the piano and violin, a paper prepared by Professor C. H. Smyth, Jr., of Hamilton College, Clinton, N. Y., was presented by Professor William North Rice, of Middletown, Conn. The subject was, "The Geology of the Adirondacks." (See p. 44.) The kind of rock of which these mountains are composed, the Archæan rock called *gabbro*, was clearly explained, and by means of specimens Professor Rice showed the large crystals formed by great pressure. Allusion was also made to the sandstones, the stratified rock found just outside the mountain region.

Professor C. H. Hitchcock, of Hanover, N. H., spoke concerning the effects upon the Adirondack mountains of glacial action and erosion. The power of water was especially illustrated in cutting the gorge of the Ausable lakes.

October 11, 1898. — One Hundred and Eighty-fifth Corporate Meeting.

President Niles in the chair.

On account of the large attendance, about 290 persons, the meeting adjourned from Room 11 to Huntington Hall. The reading of the records was omitted. Thirty-nine candidates for corporate membership were elected. The President appointed, as a committee to nominate officers for 1899, A. S. Parsons, G. M. Jones, Mrs. C. H. French, E. F. Merriam, and Mrs. D. L. Viles.

Mr. Joseph E. Stevens addressed the Club concerning "Manila and the Philippines." Mr. Stevens resided in Manila two years, from 1894 to 1896, representing a Boston commercial house, and during his stay took many photographs. Seventy-five stereopticon views from some of these were thrown upon the screen. He gave a very interesting account of his experiences, enlivened with humorous stories illustrating characteristics of the people. The pictures showed the scenery of Manila and the neighboring mountains, and the dwellings and customs of the Filipinos.

November 9, 1898. — One Hundred and Eighty-sixth Corporate Meeting.

President Niles in the chair.

About one hundred and ninety persons were present. The records of the June meeting, the July field meeting, and the October meeting were read and approved. Thirteen candidates for corporate membership were elected.

Mr. Harvey N. Shepard, Chairman of the Trustees of Real Estate, announced the gift to the Club from Miss Sarah B. Fay of a large tract of land in the heart of North Woodstock, N. H., and it was voted that a committee be appointed by the President to draft resolutions expressing the appreciation of the Club for this generous and valuable gift. The President subsequently appointed Messrs. Harvey N. Shepard and Charles E. Fay.

The subject of the evening was, "New Rambles on Canadian Snowfields (1898)." Mr. Rest F. Curtis gave two short papers, "A Day in the Selkirks" and "The First Making of Abbot Pass." (See page 31.) Professor Charles E. Fay gave an account of explorations in the region of Sherbrooke Lake and Mount Balfour, and the ascent of a virgin peak, which they named "Mount Niles," for the President of the Club. (See p. 93.) Though taken by surprise, President Niles responded with very appropriate remarks expressing his appreciation of the compliment thus paid him. A large number of interesting stereopticon views were shown during the evening.

December 14, 1898. — One Hundred and Eighty-seventh Corporate Meeting.

President Niles in the chair.

One hundred and twenty persons were present. The records of the last meeting were read and approved. Miss Sarah B. Fay was elected a Corresponding Member, and seventeen candidates for corporate membership were elected.

Upon recommendation of the committee appointed at the last meeting, the following was adopted: —

“The Appalachian Mountain Club desires to express to Miss Sarah B. Fay, and to engross upon its records, its profound appreciation of the generous public spirit and keen sense of what the sympathetic enjoyment of nature can do for man, that have led her to set apart for the public a large and beautiful tract at North Woodstock, New Hampshire.

“The Club would furthermore give expression to a feeling of permissible satisfaction that Miss Fay has seen fit to make it the custodian of this public trust. In accepting the same, it pledges itself to administer it, so far as lies in its power, in such a manner that dwellers and sojourners in the fair Pemigewassett valley may derive the fullest benefit from this valuable donation, and that others may elsewhere be moved to similar benefactions.”

The President appointed as Auditors Messrs. Alvin R. Bailey, Henry S. Bean, and C. N. Mason; and as Committee on the Annual Reception, Professor Edwin A. Start, Chairman, Miss M. A. Knowles, Mr. W. S. Rumrill, Miss Helen E. Endicott, Mr. Jarvis B. Keene, Miss Anna E. Lanning, Miss Susanna Saunderson.

The reports of the Councillors of Topography, Art, Exploration, and Improvements were presented. (See pages 85-100.)

Miss Rose Hollingsworth gave a talk on “Some Temples, Tombs, and Palaces in India and Burmah.” Many beautiful stereopticon views were shown. The speaker first took the audience to Burmah, Rangoon, and Mandalay; then to the Hindoo Temples in the Madras district of Southern India; and finally to Northern India, Benares, Agra, and Delhi. The lecture closed with a few beautiful views of the Himalayas.

December 20, 1898. — Special Meeting.

President Niles in the chair.

Ninety-five persons were present.

Mr. F. V. Fuller gave an account of the Club trip last June to Mount Grace, Warwick, Mass. He described the delightful ride from Athol, also the Club land on the lower summit of Mount Grace, together with the views, the minerals, flowers, ferns, and birds. The paper closed with a word of appreciation for the love of nature which members of the Club possess.

Rev. H. M. Penniman, of Berea College, Kentucky, then spoke upon

"Saddle Scenes among our Contemporary Ancestors." The civilization of the Kentucky mountaineers belongs to the seventeenth and eighteenth centuries, and the speaker illustrated their interesting characteristics with numerous stories given in the mountain dialect. The customs of the moonshiners, the sermons of the mountain preachers, and the experiences of last summer's camping party were vividly portrayed.

January 11, 1899. — One Hundred and Eighty-eighth (annual) Corporate Meeting.

President Niles in the chair.

One hundred and forty-five persons were present. The records of the last meeting were read and approved. Professor John Muir of San Francisco and Prince Luigi Amadeo of Savoy were elected Honorary Members. Eleven candidates for corporate membership were elected.

The annual reports of the Recording and Corresponding Secretaries, Treasurer, Trustees of the Permanent and Reserve Funds, Trustees of Real Estate, and Auditors were presented.

Professor C. E. Fay, at the close of the Treasurer's report, moved that the hearty thanks of the Club be extended to the retiring Treasurer, Mr. John E. Alden, for the splendid service he has rendered during the past eleven years. The motion was seconded by Mr. R. F. Curtis, and passed unanimously by a rising vote. It was then voted that the annual reports be accepted and placed on file.

The report of the Excursion Committee, somewhat abbreviated, was presented by Mr. P. B. Field, that of the Room Committee by Mr. J. Ritchie, Jr., and that of the Committee on the Sella Collection of Photographs by Mr. C. E. Fay. Communications expressing thanks of organizations for the loan of the photographs were read.

Mr. A. S. Parsons, Chairman of the Committee on the Nomination of Officers for 1899, reported as follows: —

For President, John Herbert; for Vice-President, Edwin H. Abbott; for Recording Secretary, Rosewell B. Lawrence; for Corresponding Secretary, John Ritchie, Jr.; for Treasurer, Rufus A. Bullock; for Councillors: Topography, Gordon H. Taylor; Art, Helen E. Endicott; Exploration, Charles L. Noyes; Improvements, Parker B. Field; for Trustees of Permanent and Reserve Funds (for three years), Charles H. French; Real Estate (for four years), Charles E. Fay.

The Committee presented no candidate for Councillor of Natural History, Mr. A. Lawrence Rotch having declined a reelection. It was voted that the Committee be requested to nominate a Councillor of Natural History at the next meeting of the Club. The President appointed as tellers Messrs. H. N. Shepard, Cheever Newhall, and E. W. Howe, and the balloting for officers resulted in the election of the candidates nominated.

The retiring President, Professor William H. Niles, addressed the Club on the following subject: "Our Land is rapidly becoming old and worn. Why? What we as Appalachians may do for our Country." The speaker

mentioned the various agencies through which the land is becoming worn. In many ways the extension of civilization in the nineteenth century has affected the landscape,—the productiveness of soil, the accessibility of land, the work of park commissions. The land shows age according to the use which has been made of it. Streams are diminishing and becoming more subject to floods, which rapidly wear away the land. The changes wrought by the indiscriminate cutting of forests were dwelt upon, and also the influences of trusts for the cutting of timber and the manufacture of pulp and paper. All these changes are disastrous to scenery. Italy affords us a striking example. Moreover, animal life, including even the fish in the sea, is being sacrificed. Such results are due to greed and the lack of love for the beautiful in nature. As members of this Club we can encourage associations for the preservation of forests, fish, and game. We can exercise a healthful influence over children, and through photography cultivate an appreciation of nature. We can influence legislative committees, command the respect of the public for our work, and cultivate a proper sentiment of regard for nature.

January 19, 1899. — Special Meeting.

President Herbert in the chair.

One hundred and seventy persons were present. The Recording Secretary gave notice of the annual reception to be held February 10 at the Vendome, and the snow-shoe excursion to the Iron Mountain House, Jackson, February 18-27.

This was the second meeting devoted to last summer's explorations in the Canadian Rockies. The map shown was prepared from observations made by Mr. Charles S. Thompson, companion of the two speakers of the evening, Rev. Harry P. Nichols being the fourth member of the party. Mr. George M. Weed presented a paper entitled "The Pipestone and the New Pass to the Bow" (see page 10); and Rev. Charles L. Noyes described "New Work on the Waputehk Snowfield and the Capture of Mount Bal-four" (see page 20). One hundred and fifty lantern views were shown.

February 2, 1899. — Special Meeting.

President Herbert in the chair.

About one hundred and fifty persons were present.

Dr. Lyman B. Sperry gave an illustrated lecture, "Mount Ætna." Although the Club has been favored with descriptions of mountains in many parts of the world, this subject was new, and, through the graphic powers of the speaker and his fine lantern-slides, was rendered unusually interesting. Dr. Sperry first gave the history of the mountain, mentioning three eruptions before Christ, and the great one which, one thousand years later, directly and indirectly destroyed 100,000 lives. His ascent was during an eruption in October, 1892. He described the night view of the phenomenon, and the pictures showed columns of mud, steam, and cinders. The

weather was fine ; at an elevation of 11,000 feet he saw the sun rise from the sea ; and Malta was visible at a distance of 145 miles, a very unusual phenomenon.

February 8, 1899. — One hundred and eighty-ninth Corporate Meeting.

President Herbert in the chair.

One hundred and ten persons were present.

Six candidates for corporate membership were elected. The Chairman of the Trustees of Real Estate announced that he had appeared before the Judiciary Committee of the House of Representatives at Concord, N. H., to advocate the exemption of the Club's lands from taxation.

Mr. J. E. Chamberlain addressed the Club on "Cuban Mountains and Valleys as our Soldiers saw them." He described the approach to the eastern part of the island, the landing at Daiquiri, the advance to the front, and the engagements at Las Quasinas and San Juan ; but the larger part of his remarks bore upon the physical features of the country, — the mountains, 6000 to 8500 feet in height and fantastic in outline, descending apparently to the edge of the sea ; the coast terraces, the forests, grassy glades, and streams, the flora and fauna ; and the climate, including the daily thunder-storm. The beautiful scenery of bay and mountains about Santiago was specially emphasized.

March 8, 1899. — One hundred and ninetieth Corporate Meeting.

President Herbert in the chair.

About two hundred and ten persons were present, and, the audience being too large for Room 11, the meeting adjourned to Huntington Hall.

Mr. Henry G. Bryant, President of the Philadelphia Geographic Society, was elected a Corresponding Member. Twenty candidates for corporate membership were also elected. The Committee on the Nomination of Officers presented the name of Leon S. Griswold for Councillor of Natural History, and upon ballot being taken he was elected to that office.

The first speaker of the evening was the newly-elected Councillor of Natural History, Mr. Leon S. Griswold, and his subject was "The Florida Everglades." The explorations were made in the interest of the United States Geological Survey. The speaker first described the coast, — the new or outer coral reef ; the ancient coral reef, to which belong the islands called keys ; the lagoons and inside passages ; and the strip of dry soil bordering the mainland. The great interior portion of Southern Florida consists of mud and shallow water, in which there is a rank growth of sword-grass about six feet high. In this sea of grass are many small islands, or keys, consisting of a tangled mass of bushes and dwarf trees. The soil is like a sponge. The explorer and his guide poled and dragged their dug-out Indian canoe through this wilderness of grass, camping at night upon the keys. Some description was also given of the Seminole Indians and their customs. Twenty-five lantern views were shown.

Mr. Harvey N. Shepard then described a trip through the Windward Islands. He referred to the situation of the islands; their origin, either coral or volcanic; and their nationality, Dutch, Danish, French, and English. Especial emphasis was laid upon the fine mountain scenery, the luxuriant vegetation, and the dense population. The views, many of them taken by Mr. O. B. Cole of the Club, were very interesting, and well illustrated the scenery and the people. Stops were made at many of the islands, but those specially noticed were St. Thomas, Guadeloupe, Martinique, St. Lucia, and Barbadoes.

The following report of the meetings held during the Excursion to Dixville Notch, while not technically a part of the Club records, are here appended:—

During the stay of the Appalachian Mountain Club party at The Balsams, in Dixville Notch, two evening meetings were held for the presentation of papers, Professor W. H. Niles, President of the Club, being in the chair. The first of these meetings was on Saturday evening, September 24, when the principal entertainment was a reminiscence by the Swami Abhedânanda, who spoke of the mountains of his native land, the Himalayas. President Niles in a graceful speech introduced the speaker to his auditors, noting in advance the pleasure that the Club members would have in listening to one who knew these splendid mountains so well.

In the beginning of his address the speaker referred to the current mispronunciation of the name of these mountains, which is properly Himâl-ya. The name is from the Sanskrit, meaning "the abode of snow;" and the range extends for three thousand miles, with a width in some places of about one thousand miles. He then described his journeys through these regions.

According to the custom of his order, he carried no money or provisions with him, relying everywhere on the contributions of the inhabitants. The order to which the Swami belongs is one dating back to traditionary times. The meaning of the word is "teacher," and the members of the order are living examples of morality and spiritual life. Throughout his travels Abhedânanda went barefooted, and, when no houses were available, slept in caves or in trees.

The speaker described the route up through the gorge of the Ganges to Kedar, some 16,000 feet above sea level, a journey requiring some fifteen days on foot. Here it was excessively cold, and firewood being scarce it was difficult to melt ice enough to get sufficient water to drink. Two other later journeys were to still different regions in the Himalayas, the last being to Darjeeling.

The address was filled with interesting items concerning the people and their customs. There is a race of hill-men, for example, a stout, strong people used to the bearing of burdens. There are no roads for wheeled vehicles in some parts, but those who wish to travel but cannot walk may be carried by these men in a *chaise-à-porteurs*. One man, even, can carry a

traveller on his back in a kind of a chair, or a load of two hundred pounds, and this to a distance of twenty or thirty miles a day. The natives wear trousers made of cloth woven by themselves, and woollen coats, and they live on vegetables and cereals, with some meat from sheep and goats. These domestic animals are the beasts of burden of the country, and form an important item in its commerce.

These people were characterized as truthful and honest; they live without locks on their doors, and learn to steal and lie only through contact with other nations. The region in which they live is remarkable not only for the magnificence of its mountain peaks and glaciers, but also for the variety and profusion of its wild flowers. In Kashmir, for example, the saffron flower covers great fields as with a velvet carpet brilliant in color, and fills the air with its perfume.

At the meeting on Friday evening, September 30, the first speaker was Mr. E. A. Whitman, whose theme was "The Mountains of Georgia." He had lived for a portion of his life in Alabama, and his paper was a bright and spicy impromptu talk on the country, its general topography, some of the special features of the landscape, with comments on the natives, their means of livelihood, crops, houses, manners and customs, and their superstitions.

Professor Niles himself furnished the second address of the evening, the subject of which was the geological story of the region in which the meeting was being held, the Dixville Notch. He referred in a general way to notches in different parts of the State or country, showing the relations of these gaps in a mountain chain to the chain itself and to the valleys. He also discussed the peculiarities of a number of the well-known mountain notches of New Hampshire. "The distinguishing feature of this notch," said Professor Niles, "is the closeness of its walls. Nowhere else have we found such arêtes, such spires, nor do we find elsewhere in New England anything of this kind which approaches it in picturesque features." The special reasons for this were then outlined. The rock lies in layers which are almost vertical. On account of this it is particularly susceptible to frost-splitting and to weathering of all kinds. The vertical seams are admirably adapted to produce erosion. The question how such a valley could be cut through such a mountain was then answered. Attention was called to the conformation of the country; the fact that the Errol side of the country is at a much lower level than the Colebrook side; that the hotel lies in a great, curving sweep in the hills; and that the surrounding district is rich in terraces and other evidences of the presence of water. A great lake was here at one time, and the curved sweep was token of a current which must have rushed through the gorge.

The speaker noted quite at length the evidence tending to support the idea that the notch was carved by a stream. He remarked the close resemblance between Dixville Notch and the Kanderthal, suggesting at the same time that the latter is in an earlier stage of its development. According to Professor Niles, the canyon at Dixville was cut down by the action of water vertically through the rock to a much greater depth than is now visible.

Since that time the erosion which has slanted the walls of the notch has caused material to drop to the floor of the notch, filling it to its present level. The process has been a slow one, and the time of the formation of the canyon comparatively recent.

Officers for 1899.

President.

JOHN HERBERT, 19 Milk Street, Boston.

Vice-President.

EDWIN H. ABBOT, Tremont Building, Room 11, Boston.

Recording Secretary.

ROBEWELL B. LAWRENCE, Tremont Building, Room 745, Boston.

Corresponding Secretary.

JOHN RITCHIE, JR., Box 2725, Boston.

Treasurer.

RUFUS A. BULLOCK, 27 School Street, Boston.

Councillors.

Natural History, LEON S. GRISWOLD, Dorchester.

Topography, GORDON H. TAYLOR, Boston.

Art, HELEN E. ENDICOTT, Canton.

Exploration, CHARLES L. NOYES, Somerville.

Improvements, PARKER B. FIELD, Milton.

Trustees of Permanent and Reserve Funds.

CHARLES H. FRENCH. REST F. CURTIS. ISAAC Y. CHUBBUCK.

Trustees of Real Estate.

HARVEY N. SHEPARD, *Chairman.* J. RAYNER EDMANDS.

CHARLES E. FAY. AUGUSTUS E. SCOTT.

CHARLES L. NOYES, *Ex-officio.*

Members added since January, 1898.**. HONORARY MEMBERS.**

Luigi Amadeo di Savoia, Turin, Italy.
Muir, John, Martinez, Cal.

CORRESPONDING MEMBERS.

Bryant, Henry G., Philadelphia, Pa.
Fay, Miss Sarah B., Boston, Mass.
Vallot, Joseph, Paris, France.

CORPORATE MEMBERS.

Names of Life Members are printed in small capitals.

Adams, Henry S., Dorchester.	Daly, Mrs. E. M., Boston.
Bailey, Dudley P., Everett.	Damon, Percy W., Melrose.
Bailey, Frederick H., Cambridge.	Damon, Mrs. Percy W., Melrose.
Baker, Miss E. Y., Watertown.	Dana, James, Brookline.
Barry, Charles T., Roxbury.	Davis, Miss H. L., Brookline.
Berry, Benjamin H., Lynn.	Davis, Samuel, Newton.
Bird, Miss H. E., Cambridge.	Dawson, Charles J., Jamaica Plain.
Blackall, Mrs. C. H., Cambridge.	Dawson, J. Fred., Jamaica Plain.
Bourne, Miss L. S., Dorchester.	Decker, W. E., Boston.
BOWDITCH, JAMES H., Brookline.	Dewick, Miss Mary G., Dorchester.
Brackett, Miss Louise C., Merri- mac.	Dick, John M., Boston.
Bradford, Edward H., Boston.	Dole, Charles F., Jamaica Plain.
Breed, Charles N., Lynn.	Draper, Miss Jane F., Watertown.
BREED, STEPHEN A., Lynn.	Dunham, Herbert M., Somerville.
Brewster, Edwin T., Andover.	Elliott, Arthur W., Roxbury.
Brown, Mrs. Nelson H., Boston.	Evans, Edgar I., Brookline.
BROWN, ROBERT, New Haven, Conn.	Fennessy, Miss Mary, Brookline.
Bumstead, Mrs. M. W., Watertown.	Fishburn, Randolph E., Chicago, Ill.
Buy, Arthur F., Boston.	Flint, Albert F., Boston.
Campbell, A. H., Plymouth, N. H.	Forbes, Fayette F., Brookline.
CAREW, GEORGE, So. Hadley Falls.	Forbes, Mrs. Fayette F., Brookline.
Chamberlain, L. E., Brockton.	Ford, Miss Harriet J., Millbrook.
Clark, Miss Ida A., Cambridge.	French, N. S., West Roxbury.
Clough, George A., Roxbury.	Frye, R. G., Sharon.
Cousens, Charles W., Roxbury.	Gallagher, Percival, South Boston.
Creeley, Oscar S., Belmont.	Gates, Henry M., Springfield.
Curtis, William B., New York City.	George, N. R., Jr., Boston.
Cushing, Miss C. W., Brookline.	Goddard, Henry A., Somerville.
CUSHING, MISS KATE W., Cam- bridge.	GOODE, JOHN F., Charlestown.
Cutter, Henry O., Cambridge.	GOODE, MRS. JOHN F., Charles- town.
Cutter, Mrs. Henry O., Cambridge.	Goodwin, Percy F., Winchester.
	Goodwin, William H., Winchester.

- Hall, Miss C. T., Roxbury.
 Hall, Edward H., Brookline.
 Hawes, Edward S., Brooklyn, N. Y.
 Haynes, Alberto F., Watertown.
 Heard, Miss Fanny, Boston.
 Hewins, Alfred S., Cambridge.
 Hill, Miss Marion, Brookline.
 Hoffman, Mrs. Julia E., Boston.
 Holbrook, Miss I. B., Mattapan.
 Homer, Edwin L., Boston.
 Hopkins, A. T., Boston.
 Hosmer, Mrs. H. A., Watertown.
 Howard, A. Gale, West Roxbury.
 Howe, George E., Somerville.
 Howell, Edward J. H., Phila., Pa.
 Hunt, Mrs. J. C. W., Tacoma, Wash.
 Ide, Miss Louise, Jamaica Plain.
 Jackson, Miss Kate, Newton.
 Jackson, Miss Mattie H., West Newton.
 Jenison, Miss Anne, Boston.
 Jenkins, James R., Circleville, Ohio.
 Jennison, Miss Ella E., West Newton.
 Jennison, Miss Lucy A., West Newton.
 Johnson, William L., Dorchester.
 Kagan, Josiah M., Cambridge.
 Keene, Mrs. Jarvis B., Watertown.
 Kelly, Miss S. G., Brookline.
 Kelsey, W. Hargrave, Cambridge.
 Kendall, Miss Elizabeth K., Boston.
 Kieser, Miss F. H., Newton Centre.
 Kimball, Miss Isabel M., Boston.
 Kingman, Abner A., Brookline.
 Larned, Miss Lizbeth, Milton.
 Learned, Miss G. D., Boston.
 Little, Mrs. Susan H., Merrimac.
 Lloyd, Andrew J., Boston.
 Lord, Calvin, Salem.
 Low, Harry C., Boston.
 Luce, Mrs. Robert, Somerville.
 McINNES, EDWIN G., Boston.
 McNair, Miss Louise, St. Louis, Mo.
 Macomber, Miss Alice M., Newton Centre.
 Manning, J. W., Boston.
 Marshall, Herman W., Brockton.
 Marsters, Miss G. M., North Cambridge.
 MASON, CHARLES F., Watertown.
 Matthews, Frederick H., Boston.
 Meader, F. E., Boston.
 Merrill, Alden, Dorchester.
 Miller, Miss Ada P., Newton.
 Mitchell, Walter C., Chelsea.
 Moore, Albert H., Andover.
 Morris, George K., Newton.
 Morse, Miss Eva S., Roxbury.
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An Ascent of the Grand Combin.

BY CHARLES F. JUDSON.

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THIS peak, one of the loftiest in Western Switzerland, rises to an altitude of 14,163 feet. Although originally known under the Saracen name of Graffeneire, it finally became distinguished by its present name from the Combin de Corbassière, a lower summit in the same range. Its ascent was first accomplished in the year 1857, by an Englishman, Mr. William Mathews. The reputation of this mountain depends chiefly upon the magnificent panorama its summit commands. The remote situation of the Combin accounts for the neglect it has suffered in comparison with its more famous neighbors, Mont Blanc and Monte Rosa. These peaks have of late years been vulgarized by the ascent of countless amateurs, but the Combin, thanks to its isolation, has become popular only among the mountaineering fraternity.

In the fall of 1890, I embraced an opportunity to cross from Italy into Switzerland via the Great St. Bernard pass. There had been almost uninterrupted good weather for the past four weeks, when I set out from Genoa on my journey. It was the 9th of October. Ascending the valley of Aosta by railway to the town of that name, I started thence on foot for the Hospice, under a broiling sun. To the north rose the imposing mass of the Grand Combin. On this side its lofty precipices were quite bare of snow, and the aspect of the mountain was dark and forbidding. Gazing up at it through the shimmering heat, I determined then and there to reach its summit within

two days if I could secure good guides for the trip. Towards evening I reached the Hospice, which lies in a bleak defile, exposed to the ravages of the north wind. The contrast between this desolate spot and the scenery of the Riviera was sudden and striking.

The next day a five hours' walk brought me to the little village of Bourg St. Pierre, the nearest to the foot of the Combin, in the Val de Bagne. It consists merely of a few chalets, nestled snugly against the hillside in a well-protected nook. The weather was still perfect, and I determined to execute my plan. The first step in the expedition was to secure reliable and experienced guides, at a reasonable price. I consulted the landlord. His preference was for Michel Genoud, whom I also knew to be trustworthy. The latter presently made his appearance, a short, heavily built, stocky individual with jet-black hair and a grizzled beard. His weather-beaten features and rugged air suggested a man inured to hardships and privation. He was at first reluctant to try the ascent, on account of the lateness of the season, and explained that owing to midday sun and midnight cold, the glaciers and upper snow-fields (*névé*) would be covered with ice, which would necessitate much step-cutting, while the growing shortness of the days would make the undertaking hazardous. His opposition diminished when he heard that I had spent several seasons mountaineering in the Alps. When I offered him fifty francs for the trip, to divide between himself and a second guide, the bait was too tempting to be refused.

He took my shoes, which were not made for climbing, and studded them with hobnails, besides garnishing them with a thick coat of grease, which helps to keep out the wet. An old alpenstock was furnished me, and presently Omer Ballays was introduced as the second guide. He was a sturdy young fellow of pleasing appearance, and his strength proved of the greatest service during the expedition. I expressed my satisfaction at Michel's choice, and we all shook hands on the bargain. The larder of the house was then ransacked for provisions. Large slabs of cheese, cold ham, mutton, two loaves of bread, butter, hard-boiled eggs, three litres of *vin ordinaire*, and a flask of cognac were hastily collected and stowed away in the guide's

capacious knapsacks. There seemed enough food to last us several days.

Soon after three o'clock we set out for the Chalet d'Amont, the highest habitation in the Valsorey. Our path ascended rapidly through pastures where sheep and goats were browsing. We followed at first the bank of a noisy mountain stream. The head of the valley was closed in by the Combin on the left and Mont Vélan on the right. Between them descended a large glacier, much broken into *séracs*, as the pyramids and columns of ice and snow are called which result from the sudden descent of an ice stream over a sharp declivity. The cross-breaking strain is such as to convert the smooth glacial surface into towering pillars of every conceivable shape and size. Those who have had the experience of threading their way through the intricacies of these labyrinths will have vivid recollections of the stirring moments; for these *séracs* are sometimes of such unstable equilibrium that the guides will not allow a word spoken above a whisper in their vicinity, fearing that the vibrations communicated to the air might suffice to bring the toppling masses crashing down upon them.

We had advanced some distance up the valley when a friend of Omer Ballays suddenly made his appearance from behind some boulders where he was in hiding. Seeing us in the distance he feared the village gendarme was on his track, but when he heard Omer's peculiar whistle he emerged, bearing slung over his shoulder the carcass of a fine chamois buck which he had dispatched the previous day far up among the glaciers. Hunting chamois at that time of year was strictly forbidden and punishable by a heavy fine. Michel told me the market value of the animal was about twenty-five francs, or five dollars.

We reached the chalet about six o'clock. It was quite comfortable in appearance. A low platform of boards, raised about a foot from the ground and covered with sweet-smelling hay, made our resting place. We soon built a fire and filled the kettle. But the fire refused to blaze, and so we could not boil the water. Meanwhile the low room became filled with smoke. Our annoyance and vexation became steadily greater. We could hardly speak without a fit of coughing, and yet we did not relish the idea of a cold supper after the exertions of the

day. At last, Omer was clever enough to divine the cause of our misfortune. He had forgotten to remove from the chimney the stone slab which is always laid over it during the winter to keep out the snow. When this was done, the fire blazed up cheerfully, and we were soon able to breathe comfortably. The *chef d'œuvre* of our meal was some hot chocolate, which we relished keenly after our brisk walk up the valley. When supper was over, we sat around with lighted pipes, and narrated various thrilling experiences, a game in which the guides easily excelled.

Turning in for the night consisted in removing our nailed boots, putting our knapsacks under our heads, and wrapping ourselves each in a blanket. I lay sandwiched in between the guides, who were soon snoring loudly. After watching for some time the flickering light cast by the dying embers on the walls and rafters, I endeavored to follow their example, but with little success. The chief causes of my failure were the frequent visitations of agile fleas and hungry mice. The latter scurried about, nibbling at everything within reach, and made no exception of our toes, which protruded now and then from the blankets. The repeated onslaughts of these visible and invisible enemies destroyed the calm of the night. In addition, those thoughts which haunt the climber on the eve of a great ascent, — the eager anticipation of the morrow, the doubt of final success, that feeling of uncertainty which one cannot shake off and yet would not dispense with, — occupied my mind. After what seemed but a short hour of deep sleep, I awoke to find the guides stirring. It was one o'clock. We disposed of a few cups of coffee, and set forth soon after two.

Starting out at this hour on a serious expedition, one cannot but feel the mystery of the situation. On all sides loom up in the darkness huge mountain masses, their outlines barely revealed by the starlight, which sheds a faint gleam on the distant glaciers. Beside the measured footfalls of the party, nothing is to be heard, except the rushing of the unseen torrent and the noisy splash of the rolling stones it carries along in its precipitate descent. The rude knapsacks, the coils of rope round the guides' shoulders, and the ice-axes ringing as they strike the ground, make the midnight attack seem like a surprise party

about to storm the mountain fastnesses before their defending genii are up and awake. A certain solemnness and an air of dogged resolution are evident in the slow but steady gait which one unconsciously assumes. Not an unnecessary word is spoken.

Our path led at first up steep, grassy slopes, then skirted the edge of a deep ravine, and finally ascended a rock chimney. We felt our way from one hold to another, picking our steps as the light flashed for a moment on the path and then vanished, leaving one to grope along as best he could. A long pull over rock debris and a lateral moraine brought us to an expanse of snow-covered glacier. Then a tedious wait of nearly an hour ensued, for the guides dared not cross the crevassed glacier by candle-light. To keep off the cold, Michel and Omer resorted to the brandy flask, which they had soon emptied, — a pernicious practice, for the temporary warmth gained by such stimulation is more than offset by the subsequent dispersion of heat from the surface of the body. I drew on my sweater, which I had fortunately with me, and stamped about on the snow; but, in spite of all, I was soon thoroughly chilled by the piercing morning air.

At half past five dawn cast its rosy light on Mont Vélan to the south of us. Soon after the Graian peaks, Mont Emilius, the Rutor, the Grivola, were lighted up one by one. Long before the grand sight was over, the cold compelled us to move on, cutting steps in the frozen crust, which had in some places become a sheet of blue ice. Around us was perfect silence except for the musical creak of the snow under our feet. We missed the vivifying rays of the sun and the gurgling of the little rivulets which on a warm day course over a glacier's surface. While our advance was tedious, there was full opportunity to admire Mont Blanc's southern cliffs, and the massive pyramid of the Grandes Jorasses. Aiguille Verte's bold crest was silhouetted on the deep blue of the horizon. At its side towered like an obelisk the Aiguille d'Argentière. Toward Savoy Monte Viso and even the remote Dauphiné peaks were revealed in never-to-be-forgotten beauty and distinctness. No trace of mist, cloud, or haze marred the wonderful purity of the atmosphere that October day. But the condition of the moun-

tain was unfavorable. As far as we could see, the upper névé had turned into ice. To avoid the continuous labor of step-cutting, we took to the rocky ridge skirting the glacier on our left. Ascending its flank, we followed the crest of this outlying spur of the Combin until at half past nine we had reached the usual breakfasting-place.

This was a point on the southwestern arête (as the mountain ridges are technically called), about twelve thousand feet above sea-level, and looking down to the west on the Col des Maisons Blanches. We made a hearty meal. The guides disposed of enormous quantities of cheese, eating it as if it was so much bread, while the bread itself, with the cold meat and the eggs, disappeared as if by magic. When the time came to collect the remnants of the feast, only a few morsels remained. These the guides stowed away in their capacious pockets. We washed down our meal with copious draughts of wine. A good half hour was gone before we were ready to move on, and this proved to be our last halt of the day of any moment.

We now prepared ourselves for the more serious part of the expedition, which presented itself as the escalading of a high and precipitous rock wall, barring our way. It was seamed with ledges formed by the cropping out of strata, but these were so disintegrated by the action of the weather as to afford a very uncertain footing. Each foothold and handhold had to be tested carefully before trusting to it. The lack of this precaution nearly brought about an accident. We had advanced some way up the cliff when I was tempted to throw my weight on an inviting sally of rock which jutted forth at a convenient height and which seemed to be firm. The treacherous stone came away in my hand. I fell backward, but before I had time to realize what had happened, Omer, who was standing immediately beneath, caught me in his arms. Without his timely aid my fall would probably have been arrested only at the glacier, some fifteen hundred feet lower.

This accident was followed by a short halt, which we utilized to put on the rope. Why we were not tied up sooner, I do not attempt to explain. Such matters are usually left to the guides to decide. It was a piece of negligence on Michel's part; but I must admit he did his best to atone for it during the rest of

the day, when he was most prudent and painstaking. I was roped up between the guides, Michel leading the way. We then proceeded cautiously, one at a time, clinging to the projections which studded the face of the cliff. Michel advanced as far as the rope permitted, while I paid it out gradually. When my turn came, he hauled in the slack as Omer paid out his end of the line. We were constantly ready to support any member of the party instantly in case of a slip. Finally Omer rejoined me, and the process repeated itself. Our progress was necessarily slow. I can well recall one *mauvais pas* encountered in the ascent of a tall, slightly overhanging buttress. There was a handhold well off to the left and as high as I could reach. On the right the rock was perfectly smooth, with the exception of a small crevice which admitted only the point of one's shoe. There was no other purchase of any kind. When my turn came, I inserted my toe in the crack and made a violent effort to haul myself up. There came a strong pull from above, during which the rope slipped up under my armpits and completely checked my respiration. After some breathless moments, I found myself somehow or other by the guide's side, quite black in the face, he assured me. "This is no child's play," said Michel. "Look and see where we have come." I peered cautiously over the edge of the rocky platform on which we stood, and my glance fell almost straight down two thousand feet to the Sonadon glacier, that we had so laboriously traversed in the early morning.

Beyond this point we ascended rapidly. The ridge was a succession of rocky spurs. Here and there the snow lay quite deep where the inclination was less. At half past twelve we topped the summit of the southwestern arête, and for the first time saw the twin snow cupolas of the Combin, apparently close at hand. All difficulties seemed at an end when Michel suddenly called a halt. With a very serious air he warned me that, should we persist in the ascent and traverse the summits to descend on the north via the Col des Maisons Blanches, nightfall might overtake us well up on the mountain side. In that case our only refuge was a stone shelter hut near the Col, at an elevation of eleven thousand feet, and unprovided with wood or food. I realized the gravity of the situation. But to

turn back so near the goal, which seemed but a stone's throw away, would have been maddening. Nothing intervened between us and the summit but an easy snow arête upon which one could run. Young Omer came to my assistance and urged going on. Finally, after wasting some precious moments in palaver, Michel gave way. We rushed at the final slope, and at half past one reached the summit for which we had so long battled.

The snow-covered ridge was broad enough to allow us to move about without danger. It falls steeply on the west towards the Glacier de Corbassière, and on the north forms a second peak some hundred feet lower. To the east and south the snow curls over the precipices, forming a large cornice. This is formed by the joint influences of the wind and the noon-day heat. The upper crust of the snow, daily melting and freezing again, is blown over the underlying layers until a broad projecting shelf is formed which often assumes large dimensions. This gradually thins out into a sheet of ice only a few inches thick. From the under surface of these mountain umbrellas depend huge icicles, through which a pathway has at times to be hewn with the axe (as happened to Whymper on the Morning pass). It requires much skill on the part of a good guide to ascend a mountain arête which falls steeply on one side and is topped by a large cornice. To venture too far on the latter might cause its giving way, and only too often such accidents have happened with the destruction of all concerned. No such peril confronted us on the final slope of the Combin. While the guides kept good hold of the rope, I crawled toward the edge of the cornice and looked over to the hamlets of Chermontane and the glacier of Otemma, six thousand feet below. Scanning the vast horizon where peaks, passes, and glaciers lay extended in endless succession and countless variety, the eye soon wearied of the attempt to grasp more than the salient features of the scene. Though the lake of Geneva was veiled in mist, we saw beyond, on the slopes of Jura, a village outlined with great distinctness, more than fifty miles away. To the north lay the range of the Bernese Oberland; on the east extended the familiar peaks around Zermatt. Grandest among them all was Monte Rosa, her five summits showing plainly against the horizon.

The Mischabel, the Weisshorn, the ugly snout of the Matterhorn, and the long arête of the redoubtable Dent Blanche were easily recognized as old friends.

Only too soon these "crowded moments of glorious life" were over. We tore ourselves away from the sublime spectacle, which seemed to impress even the guides, and prepared for the descent. Three short hours of daylight remained in which to reach a place of safety. Reversing our order of march, we rapidly traversed the second peak and presently arrived at the *mur de côté*. This steep slope of ice is about one thousand feet high, and covered by a foot of hard snow. To descend it safely, large steps have to be hewn through the snow into the ice beneath. This was young Omer's task, and assuredly no light labor. Four or five lusty blows with the pick of the axe were required to hew each step, and one or two more with the broad end to level and clear it of loose snow. The slope varied in inclination from 40° to 50°. The steps were nearly two feet apart. Michel and I drove our sticks deep in the snow at each descent for additional support. Here and there great crevasses yawned at the foot of the slope, which shot away rapidly below us to end in abrupt precipices. I shall not soon forget the anxious tone in Michel's voice, when I swayed a little in descending a high step, "Don't slip, don't slip!" This was the most trying part of the expedition. I was handicapped by the absence of regular climbing shoes. Those I wore were thin, and only scantily studded with the hob nails which are so necessary to sure footing on the ice. To make matters worse, the alpenstock I carried was so blunt that it sometimes failed to pierce the hard snowcrust, and in glancing nearly threw me off my balance. The combined effect of the rarefied air, the long-continued exertion, and the lack of sleep made me very drowsy. Fortunately there was neither now, nor at any time during the day, any wind, which would have materially added to our discomfort.

At last we crossed the bergschrund,—the large crevasse separating the rocky flank of a mountain from the upper névé. We then turned to make our way back over the snowfields towards the Col des Maisons Blanches. Our route now traversed the huge plateau of Corbassière, which stretches at the

foot of the summits on the west. Being at an elevation of twelve thousand feet, it commands a magnificent prospect. Above us hung huge masses of ice, twenty to forty feet in thickness, which had strewn the névé with avalanche debris, making it resemble in places a cobblestone pavement. We made rapid progress, only occasionally breaking through the crust into the soft snow. Shortly before five o'clock we reached the Col des Maisons Blanches, and gloried in the wonderful sunset. The whole western horizon glowed a rosy pink fading into the deepest blue, against which every tiny crag of the Chamonix aiguilles was sharply outlined. Surrounded by the stillness of the great peaks and snowfields, one could not but feel the solemnity of the scene. As the sunlight faded, all changed into cold white and ashy gray. In the twilight we groped our way down the cliffs, and at last reached a snow slope down which we plunged and jumped with boyish delight. We now felt sure of a bed for the night. But this was not the end. For two and a half hours we pursued, by candle-light, a wavering course over a miserable moraine, stumbling over the rocks and frequently barking our shins. At last we reached some stony grass slopes. "If I had been God, I would never have made any moraines!" exclaimed Michel. Our thirst was intolerable, and we drank immoderately of the first brooks we encountered. One more halt to eat a bit of ham which alone remained of our odds and ends of food; then we trudged along at the lantern-bearer's heels, in a mechanical sort of way, until finally, at ten o'clock, the welcome lights of Bourg St. Pierre appeared, where after a warm supper we turned in to enjoy a well-earned rest.

Glacial Erosion in the Valley of the Ticino.

BY W. M. DAVIS.

Read January 19, 1900.

AMONG the amusing pictures in a volume of the *Fliegende Blätter* that I had ample time to look over during the bad weather of April, 1899, at Lugano, was one of a visitor in a Swiss hotel, who was reproached by his host for having let a

week pass without climbing a single mountain peak ; but the visitor replied that he was a valley climber, not a mountain climber. He found sufficient pleasure at the mountain base, and such was my case also. Mountain tops are indeed worthy objects of a climber's ambition, but if one wishes to get at the bottom facts let him examine the valleys. It is fitting that even before a club of mountaineers some attention should be given to valleys, for if it were not for their erosion the mountains would usually be broad plateau-like masses of moderate local relief, and almost devoid of the picturesque variety of form that attracts so many thousands of visitors to well-dissected mountain regions. Many of the visitors fail to understand this general principle, and still follow the old belief that the mountains have been individually upheaved, each peak and ridge separately hoisted above the adjacent pass and valley, for this ancient theory has a strong popular hold and is difficult to displace. In spite of the arguments of Playfair in the first years of the century and of many others through its middle, Geikie found it advisable as late as 1887 to give two chapters in his delightful *Scenery of Scotland* to an elaborate demonstration that the Bens of the Scotch highlands are not so many individual upheavals, but that the Glens are so many individual excavations. Powell gave emphatic presentation of the same principle in one of our National Geographic Monographs, and Richter has returned to the question in a general account of Alpine forms recently published in the *Zeitschrift* of the German and Austrian Alpine Club. Mountains in which the local relief is chiefly due to deformation and upheaval are geographical rarities. All the greater mountain ranges owe their varied form to the erosion of deep valleys by the rivers that drain them ; and adjacent to many lofty ranges, the waste that has been worn from the valleys may be seen spread forth in extensive piedmont fluviatile plains.

Playfair's law. — Playfair's statement of the relation between valleys and rivers is so clear that it has not been improved on in a hundred years. "Every river appears to consist of a main trunk, fed from a variety of branches, each running in a valley proportioned to its size, and all of them together forming a system of vallies, communicating with one another, and having

such a nice adjustment of their declivities, that none of them join the principal valley, either on too high or too low a level ; a circumstance which would be infinitely improbable, if each of these vallies were not the work of the stream that flows in it" (Illustrations of the Huttonian Theory, 1802, 102). It is evident that Playfair had examples of maturely established drainage in mind, such as one may see in West Virginia or in the plateau of central France, for there the ramification of the valleys is most elaborate. Each valley is proportionate to the size of its stream ; and the valley floors are most delicately adjusted to one another at the points of confluence (or *Coblentzes*, as we might say). The case for the rivers as valley-makers is only strengthened when it is found that in certain regions occupied by young instead of by mature drainage systems, the correlation of parts is less perfect, because time enough has not yet passed to allow the development of the mature adjustments that are elsewhere so significant. In the Laurentian highlands of Canada, for example, the drainage system is as disordered as that which one may see in miniature on the arch of a road from which the snow and ice of winter have just melted off in a spring thaw ; here one may find innumerable little pools from which the water is often discharged by more than one outlet, in true Laurentian fashion ; the outflowing streams alternately flow through rushing rapids and quiet reaches ; small streams may drain broad depressions, while large streams occupy narrow gorges ; but all this disorder, so suggestive of an unestablished drainage system, is well known to be the effect of the severe glaciation which the Laurentian highland suffered not long ago, as the earth counts time.

The hanging valleys of the Ticino. — In a mountain region like the Alps, long exposed to the erosive action of its rivers, and now deeply dissected, one might well expect to find the adjustments that characterize maturely established drainage systems ; and with this expectation in mind it was with something of a shock that I saw, when ascending the valley of the Ticino by rail on the way to the St. Gotthard tunnel in the spring of 1899, that the side valleys were strongly out of accord with the main valley.

There was no " nice adjustment of declivities," for the side

valleys mouthed several hundred feet up on the wall of the main valley, and the side streams cascaded down in sharp-cut shallow clefts from their high perches to the main valley floor. It is true that I had read of the occurrence of this sort of thing in Norway, but it had never been impressed upon me that discordance between the levels of the lateral and trunk valleys was the rule in the Alps. I therefore made a second visit to this district, spending two delightful days on foot above and below Biasca, and finding that the hasty view from the windows of the express train had correctly summarized the abnormal relation of trunk and branch streams. Later observation in other valleys, and conferences with Professors Penck, Richter, and Brückner, established the generality of the discordant relation by which the valleys of the Alps so distinctly depart from Playfair's law. The persistent association of this discordance with valleys that have been strongly glaciated points so conclusively to glacial erosion as its explanation that the doubts which I had long felt as to the ability of ice to erode deep valleys and basins — doubts which were not altogether dispelled by the arguments adduced by many glacialists regarding the U-shaped cross-section of ice-worn valleys, and by the form and distribution of lake basins — were completely removed, and I came home with perhaps an over-ardent belief in the competence of glacial erosion, as is often the habit of the newly-converted.

The discordant lateral valleys are features of so much importance in strongly glaciated mountain ranges that a special name is needed for them. I gladly adopt at the head of this section the name "hanging valleys," suggested by Gilbert to describe the high-level laterals of the Alaskan fiords, as he saw them a year ago on the Harriman expedition, of which an account is soon to be published.

The problem of glacial erosion. — The doubts that one may feel as to the competence of glacial erosion to effect large changes of form are not well based on a general denial of erosion to a heavy glacier or ice sheet whose under surface is shod with boulders, gravels, and sand, which it drags heavily upon the underlying surface; for the beds from which Alpine and other glaciers have recently retreated are manifestly ice-worn. Such doubts are not well based on the merely verbal point that

it is not the ice, but the hard rock tools that the ice carries, which do the work of erosion, for the same might be said of water; nor on the occurrence of rugged ledges on the lee side of *roches moutonnées*, for a heavy glacier slowly plucks away large blocks on the lee side of slopes and knobs; nor upon the occurrence of glacial till overlying unconsolidated gravels, for it can be readily conceived that a glacier, like a river, may vary its action from place to place or from time to time, as its velocity and "load" of rock-waste vary, being a destructive agent where its motion is rapid and its pressure is great, and a constructive agent where the motion is slower and the pressure smaller.

On the other hand the familiar argument for a strong measure of glacial erosion that is based on the occurrence of lakes within glaciated regions is of great value, yet it is not always presented in a convincing form; for it has sometimes been found that so-called rock basins are really preglacial valleys blockaded with glacial drift; and, moreover, this argument has been carried to such an extreme — for example, in ascribing a glacial origin to Lake Superior — that one may reasonably feel some hesitation in accepting even the more moderate conclusions of its advocates. While strong evidence has been given of the glacial origin of many small and undoubted rock basins, the possibility of faulting and warping of the earth's crust as a means of producing large lake basins has in many cases been neglected rather than excluded. But the most serious element of doubt as to the competence of glaciers to produce significant changes of form results from our uncertainty as to the rate at which glacial erosion proceeds and as to the period during which it was in action. It is for these various reasons that I have long wished for something more decisive as to what glaciers had actually done in the way of eroding valleys or basins, and that I was greatly delighted in coming upon the discordant side valleys of the Ticino, which promised to give demonstrative evidence upon the problem in hand. But before describing these hanging valleys, a simpler example of glacial erosion may be presented.

Help from France. — There was a small bit of observation that was very helpful to me, made during an excursion over the central plateau of France with Mr. R. L. Barrett during the January previous to my visit to the Ticino; it served in a

measure to prepare the way for the better understanding of the larger problem later. The valleys of the central plateau are, for the greater part, of the most normal kind. Many of them follow incised meanders; that is, they seem to have inherited their present serpentine courses from an arrangement that the rivers had gained when the plateau that they are now dissecting was a low-lying region, a peneplain, on which a meandering habit would be most appropriate. During the incision of the new valleys beneath the surface of the uplifted lowland, the meander belt of the swinging streams (the belt that is marked out when their serpentine course is limited by a pair of tangents drawn external to their curves) has been widened, for outward erosion has accompanied downward erosion. As a result, the valleys possess steep, cliff-like walls on the outside of each curve, while long, gently sloping spurs descend from the upland into the concave side of each curve. These forms are remarkably systematic, and are to be seen over and over again in the plateau region; but on approaching the ancient volcano of the Cantal, a change in valley form is noted. The spurs no longer possess gentle slopes, but are replaced by an uneven form in which rough rocky knobs prevail. In some cases, although the stream still has a curved course, the spurs that should enter the concave curves are almost consumed; in other cases, although the meandering curves of the valley are still easily recognized, the spurs are so greatly and irregularly consumed that the river takes a short cut through a gap between the low knobs which remain where the spur used to rise. These short cuts are not to be confounded with the normal cut-offs by which a meandering river tries to shorten its course on an alluvial plain, with which they have nothing in common. The short cuts are distinct departures from the normal river habit, just as the rugged knobs are departures from the normal valley form. All these features are to be seen in the valley of the Rhue, a branch of the Dordogne, and all find their explanation in former glacial action. Signs of the former presence of glaciers, supplied from the snow fields of the Cantal, are abundant; and they have been well described by Boule.¹ The meaning of these new features may be explained as follows: A nimble river of water can easily

¹ *Annales de Géographie*, V., 1896, 277-296.

flow along a serpentine course, and in doing so it must erode a valley of highly specialized form; but a clumsy, slow-moving river of ice filling a valley of incised meanders so deep as to overflow far and wide upon the uplands, finds great difficulty in conforming to the serpentine course of the river. It therefore proceeds to grind away the valley spurs in its efforts to straighten the valley. If the rocks of the plateau (crystalline schists) had been weaker, if the ice stream had been larger, or if it had moved faster, or if the glacial period had lasted longer on the Cantal, the spurs might have been completely obliterated, and the incised meandering valley of the Rhue would then have been converted into an open U-shaped trough, without spurs descending from the uplands on one side or the other. But fortunately the conditions were here so combined that while glacial erosion was effective to the point of producing manifest changes, remnants of the preglacial spurs are still distinct enough to enable one to make tolerably definite measure of the erosion that they suffered under the ice. The value of this case, therefore, lies in the definiteness with which the form of the region before it was glaciated can be determined, in order to compare the preglacial form with the postglacial. It has been by this method of procedure that the early ideas of excessive glacial erosion in southern New England have been moderated; for it has been possible to state with some certainty that our uplands and the valleys by which they are dissected must have attained about their present form in preglacial time, and hence that glacial erosion is not here responsible for anything more than minor geographical features.

U-shaped valleys. — The more or less complete destruction of the spurs of a river valley by glacial action is probably a general feature of glaciated regions. If the spurs are completely consumed, the valley becomes U-shaped, and the view along it lacks the successively overlapping profiles, entering the valley from one side and the other alternately, and

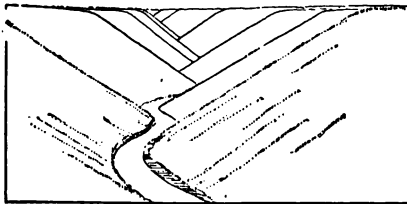


Fig. 1. The crossing spurs of a river valley.

concealing the more distant parts of the valley floor, as in fig. 1; the valley has rather the form of a trough with comparatively smooth sides along which the view may extend a considerable distance, as in fig. 2. Good descriptions of glaciated valleys in the Uinta mountains are given by King in the first volume of the 40th Parallel Survey reports. The valleys are V-shaped below the reach of the ancient glaciers, and U-shaped above. The head of the Saco valley in the White



Fig. 2. The trough of a glaciated valley.

Mountains below Crawford Notch deserves examination to see how far its smooth sides and U-shaped cross-section may be explained as the result of glacial scouring by an ice stream that hurried through this deep opening in the White Mountain mass. I have seen it only from a passing train, and then took no note as to the attitude of its side valleys; but as the problem stands in my mind to-day, discordance of main and side valleys is to be expected there.

If spurs are but partly consumed, their remains may take the form of rocky knobs, more or less isolated, rising from the valley floor. The splendid rocks of Salzburg seemed to me, from a brief walk around them, probably of this kind. The rocky knobs of Sion (Sitten), in the valley of the upper Rhone, and those of Bellinzona on the lower Ticino, may be of the same relation. Even the Borromeo islands in Lago Maggiore are within reach of this explanation. Instead, therefore, of pointing to such knobs as surviving preglacial forms which glacial erosion could not destroy, they may have to be interpreted as the remains of much larger forms which the glaciers could not entirely destroy in the period of time allowed to them.

Special features of the Ticino Valley. — The discordance of the hanging valleys of the Ticino serve as well as the battered spurs of the valley of the Rhue to give a definite basis for the

restoration of preglacial form, and thus to lead to a good determination of the depth of glacial erosion. As the argument by which this conclusion is reached is not complicated, it is my hope that this article may lead a few of the many thousand travellers who annually invade Italy by the St. Gotthard route, to stop a day or two at the village of Biasca for a walk up and down the Ticino valley in that neighborhood, and perhaps for some short climbs up to one or more of the discordant lateral valleys. The main valley is easily reached, as it lies on the southern slope of the Alps between the famous St. Gotthard tunnel and the head of Lago Maggiore. Those who stop there will be well repaid, for the region is extremely picturesque, although little visited. The hotels are truly primitive, yet sufficient for those whose interest is outdoors rather than on the *table d'hôte*.

The valley about Biasca is broadly opened and gravel-floored. The river has plenty of room to swing about from side to side. Above Biasca to Giornico, the floor is from a half to three quarters of a mile wide. Below Biasca to Bellinzona, the rock walls are a mile or more apart. Below Bellinzona, the valley floor broadens to two miles at the head of Lago Maggiore; but this change of form seems to be largely due to the filling of the valley bottom with heavy delta and flood plain deposits, so that near the lake the valley bottom is much more deeply buried than above Biasca, and features that remain visible near Biasca are hidden near the lake. Two large branch valleys join that of the Ticino at even grade; one drained by the Brenno enters at Biasca; another drained by the Moesa enters near Bellinzona. Both of these large branches head, like the Ticino itself, in the central Alps; heavy glaciers once came down all three valleys to the main trunk that leads through the deep basin of Lago Maggiore. The slope of the main valley floor is rather strong, for, in spite of the good volume of the Ticino, it cannot for the present adopt a gentler gradient on account of the abundant load of coarse detritus that is washed into it by the side streams. The valley floor has a plainly visible descent, especially apparent on the down-stream side of the alluvial fans that are formed by the smaller tributaries. Heavy engines are required to haul the trains up the valley; one of them has two cylinders on each side, each working three driving wheels, or twelve drivers in all. The



IN THE VALLEY OF THE TICINO.
From Photographs by W. M. Davis.

following distances above the head of Lago Maggiore and altitudes above sea level will be instructive in this connection : —

	Distance.	Altitude.
Giornico	41 kil.	446 met.
Biasca	32 "	289 "
Bellinzona	13 "	220 "
Lago Maggiore	0 "	197 "

It should be noted that the local fashion is not to name the larger valleys after the streams that drain them, but to give special names to certain sections and branches of the valley. Thus the large branch valley of the Brenno is called Val Blenio; that of the Ticino above Biasca is Val Levantina; below Biasca, Val Riviera. As Biasca stands at the junction of the three parts thus named, one of its hotels is called *Albergo dei tre Valli*.

Confining our attention to what we should call the valley of the Ticino for a few miles above and below Biasca, we may first note a prevailing steepness of the valley walls near their base. The slopes are truly cliff-like at many points, an unusual, indeed an unknown, feature in a valley as broad as that of the Ticino in non-glaciated regions. Quarries are numerous in the bare ledges, and many carloads of dressed stone are shipped, north as well as south. Stone is so plentiful and wood is so scarce that fence posts, fence slabs, supports for grape arbors, and house steps in the villages are all made of the more durable material. The basal cliffs are well seen in profile in many views along the valley; they are clearly exhibited by the crowding of the lower contours on sheet 508 of the Siegfried map of Switzerland (scale, 1 : 50,000). The cliff walls of the valley are sub-parallel for miles together. No spurs enter the valley floor, and a view along the valley is therefore open for considerable distances. For a number of miles above Biasca, a bench of gentler slope leans back from the top of the basal cliffs, 400 to 600 metres above the main valley floor. Here the peasants have their summer villages, with sloping hayfields and pastures. Steep paths, frequently ascending by long flights of stone steps that have been artfully constructed on the ledges of the basal cliffs, lead from the larger villages of the valley floor to the smaller hamlets of the upper bench. Wire rope is sometimes stretched

from the bench to the lower valley to carry the products of the higher ground to the lower levels. There is no indication that the change from cliff to bench is due to change in the mountain structure, for the rocks are massive gneisses of much uniformity. The benches seem to be the remnants of the slower slopes of an ancient wide-open valley, in whose floor the present cliff-walled deeper valley has been eroded, and this supposition is confirmed when it is found that the high-standing lateral valleys are systematically related to the ancient rather than to the modern valley floor. A typical cross-section on true scale is given in fig. 3 to

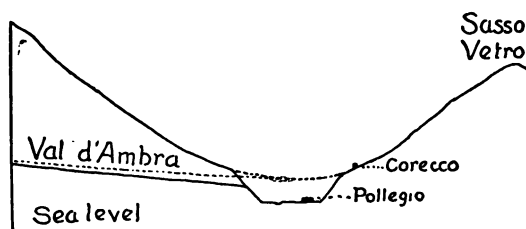


Fig. 3. True-scale cross-section of the Ticino valley.

illustrate these relations. The discordant attitude of the hanging valleys with respect to the main valley floor of to-day is thus clearly exposed. It is best seen on the ground by ascending to the bench opposite to the mouth of a hanging valley; thus an impressive view of the lateral Val d' Ambra is gained from the hamlet of Corecco (above Pollegio on the main valley floor); or of the Val di Lodrino from the chapel of Santa Pietà on the slope above the railway station of Osogna. Even a tyro in physiography must be struck with the peculiar relation of lateral and main valleys, when exhibited so clearly as it is here.

A curious consequence of the absence of normally accordant side valleys is seen in the necessity for the construction of two of the famous helical or corkscrew tunnels for the railway just above Giornico, some six miles above Biasca. Here the valley floor is obstructed by a huge moraine or landslide, and its direct ascent would be too steep for the track. In ordinary valleys a railway would begin to climb some miles before reaching such an obstruction, leaving the valley floor for an oblique path on the valley side; but this is here impossible on account of the

steepness of the basal cliffs. Another device frequently employed by railway engineers, when it is necessary to make significant gain in height in a short distance, is to lay out an upgrade detour in a side valley, and return to the main valley with a good increase of elevation. This plan is adopted on the road that leads up to the Semmering pass in the eastern Alps, south of Vienna, where the valleys were not glaciated. But no such detours can be made in the Ticino valley near Giornico, for all the side valleys mouth hundreds of feet above the main valley floor. Hence there is nothing to do but to hew tunnels, whose ascent in the solid mountain mass shall take the place of an up-grade detour in a normal side valley. The famous cork-screw tunnels, shown on the posters by which the St. Gotthard railway is advertised all over Europe, are therefore to be regarded, along with the stone posts of the grape-arbors in the vineyards about Biasca, as indirect consequences of glacial action.

The hanging valleys are well opened, and their walls are for the most part free from cliffs and strong ledges. It may be inferred from this that the main valley, to which the side valleys were once accordant, had reached a stage of advanced maturity, and that its floor was reduced to a comparatively gentle grade; for such a stage must be attained in the main valley when the walls of the lateral valleys have opened so far as to lose their cliffs. But to-day the lateral valleys are rather sharply trenched to a moderate depth, as if their streams had partly responded to the deepening of the main valley. On descending towards their bottom, the walls become too steep for climbing. The paths by which the inner parts of these high-standing valleys are reached do not follow the valley bottom near the streams, but are perched on the valley sides just above their steeper lower slopes. It would be a difficult task to cross from one side of these trenched valleys to the other. In spite of their trenching, the hanging valleys are by no means cut down to the level of the main valley floor. The streams, on reaching their notch in the top of the basal cliffs of the main valley, plunge down in a succession of superb cascades, aggregating 200 metres or more in height. Some of the streams are visible for much of their descent; others have incised sharp-cut clefts in the rock walls

and are to be seen only by clambering about at opportune points. Water power is abundant, and electric light is thus provided for small villages in which one would hardly expect to find that modern luxury.

The lateral valleys best worth visiting are as follows: above Biasca, on the southwest side of the main valley, are the Val d' Ambra, Nadro, and Cramosina; below Biasca on the west are Val d' Iragna, di Lodrino, and di Moleno; and on the east Val d' Osogna and di Cresciano, just above and below Osogna. In Val Blenio, above Biasca, the Siegfried map shows Val Pontirone and Malvaglia to be at distinctly higher levels than their master.

Effects of elevation on valley systems.—The same discordant relation between trunk and branch valleys is to be found in many parts of the Alps, but it has not been so much discussed as the associated relation between the deeper, younger valleys and the bench remnants, or *Thalstufen*, of the older valleys. The latter relation has been explained by Heim as the result of the general upheaval of the region after the older valleys had been eroded, thus causing a revival (*Neubelebung*) of its rivers, whereby the deeper younger valleys were eroded in the older ones.¹ The associated discordance of main and side valleys is interpreted as a consequence of the difference in the size of their streams; the larger river having already adjusted itself to the new base-level, while the smaller side streams have not yet been able to do so. While such an explanation of the older and younger parts of the trunk valley involves only well-known processes, and while it is eminently applicable to many examples of compound valleys elsewhere, it does not seem to be applicable to the case of the Ticino, or to other similar valleys that I have seen; for it does not give a satisfactory explanation of the relation between the trunk and the branch valleys.

Normal relation of revived trunk and branch valleys.—In discussing this problem, it will be well to consider a few examples for which the proposed explanation will be universally accepted. In order to remove all complication by glacial erosion, these examples should be selected from regions that have not suffered glacial action. One of the most perfect illustra-

¹ *Mechanismus der Gebirgsbildung*, 1878, I., 297, 301, etc.

its narrow and steep-walled young valley ; it must disappear when the erosion of the main valleys is retarded by reason of approach of their rivers to a graded condition, so that they can cut but little deeper ; for then the side streams will soon overtake the masters, and the temporary discordance of trunk and branch in early youth will be followed by the accordantness that prevails during all the rest of the undisturbed life of the river system.

Over-deepened valleys. — If we now return to the valley of the Ticino, with these principles in mind, it is evident that the main valley is not a narrow canyon, whose bottom is entirely occupied by the river that eroded it. On the contrary, the valley floor is from one half mile to a mile or more wide in the Biasca district ; and the river swings across the floor on a bed of gravel and cobbles, as it is pushed from one side to the other by the growing alluvial fans that are forming below the high-perched side valleys. If the main valley be regarded as the work of the river alone, unaided by glacial action, its breadth implies a well advanced maturity of the present cycle of erosion ; and in maturity, the side streams should normally join the trunk stream at accordant grade. The persistent failure of the tributaries in this respect proves that the valley of the Ticino has not been normally developed by the erosion of running water alone ; and thus indicates that much of its peculiar form must be ascribed to the action of the heavy ice stream that once filled it to a great depth. A diagram may make this clearer.

Let ABC, fig. 4, be the cross-section of the older Ticino valley, into which the side stream DB enters at accordant grade. The open slopes of both the main and the side valley prove them to have reached maturity, and thus further prove that the junctions of their streams must have been without break. Now imagine an uplift of the region, thus initiating a new cycle of erosion, in whose early youth the main river cuts the narrow canyon BF. The side stream may in the same brief period cut a short lateral canyon DML, but most of its valley will remain above the new level of the master. When, however, time enough passes for the young canyon BF to widen into the maturely open valley GFH, then the side stream will have cut down its valley to such a slope as KF ; and if the main valley floor becomes somewhat filled or aggraded with gravels, as to

a depth L , the side valley will also be aggraded, as to a slope KN . But, in fact, the valley of the Ticino, and all other Alpine valleys of its type, possess side streams in the attitude $DMNL$, involving an essentially abnormal relation strongly suggestive of the erosion of the new main valley GFH by ice action. The ice may for a time have risen as high on the valley

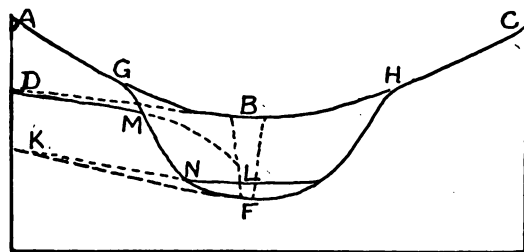


Fig. 4. Diagram of a glaciated valley.

sides as A and C , but its more enduring action seems to have been at lower levels. When it is found that this peculiarly abnormal relation of branch and trunk valleys persists in all strongly glaciated mountain valleys, the acceptance of glacial erosion as its cause is not to be avoided.

The recognition of the competence of glaciers to deepen and widen their valleys is an important supplement to the belief that they can excavate lake basins. I propose elsewhere — in the *Proceedings of the Boston Society of Natural History* — to trace the development of this idea; but it must here suffice briefly to remark that Russell, McGee, Gannett, and Gilbert in this country, Wallace, de Lapparent, Richter, Brückner, and Penck in Europe, have all called attention to it more or less fully and explicitly; yet the deepening of valleys has never been so fully discussed as the excavation of lake basins, and the hanging side valleys have seldom been recognized as essential and general features of the larger glaciated valleys in mountain regions. It has always been to my mind a difficulty in the way of the glacial origin of lakes that the glacier which could locally excavate a lake basin to a depth of a thousand feet or more had done nothing worth mentioning in the valley up stream from the lake; but this difficulty is removed when it is understood that the valley has been deepened significantly in all that part of its

length where the slope was strong and the ice was thick. Near the distal termination of the deepened part, a lake is to be expected; its waters there conceal the basal cliffs of the deepened valley. Going up the valley, the delta that has now been formed by the inflowing stream in postglacial time is of greatest depth at the head of the lake, and gradually decreases in depth further up the valley; thus the basal cliffs come into view, and the lateral valleys stand in manifest discordance with the main valley floor. The deepening of a glaciated valley for a good part of its length is thus seen to be a general result of glacial erosion; it is accompanied throughout by discordant or hanging lateral valleys, and the production of a lake in the distal portion of such a valley is but a subordinate result of glacial action. Penck has called valleys of this kind "over-deepened," and the term deserves general adoption.

Correlation of river-cut and ice-cut valleys.—The lack of agreement in level of the floor of hanging valleys with that of their trunk has thus far been described as an abnormal feature. So it certainly would be in river-carved valleys, except during their early youth, or during other special and short-lived conditions that need not be considered here. During maturity and old age, normal river valleys certainly exemplify Playfair's law. But it should be now pointed out that this law applies only to the water surface and the valley floors, and not to the actual stream beds; for even in a maturely established drainage system, the beds of the tributaries are not cut down so deep as the bed of the trunk river. If all the water should disappear during a prolonged drought, a discordance of large and small stream beds at their junction would be plainly apparent, however accordant the valley floors still are, and however accordant the water surfaces may have been during normal weather conditions. The same relation undoubtedly prevailed at the junction of large and small glaciers in valleys whose form has been significantly modified by glacial erosion. The surface of the trunk and branch glaciers must have been nicely graded in relation to each other; but the bed of the main glacier may have been worn decidedly deeper than that of the side glacier. It will thus be understood that the discordance of main and side valleys, which is so striking a feature of the glaciated Ticino district, must be

interpreted as showing a discordance of the *beds* of glacial streams, not of the glacial surfaces.

There is every probability that when the main valley of the Ticino was occupied by ice during the glacial period, the side valleys also had their local glaciers, whose surfaces joined that of the trunk glacier at accordant levels; and that the discordance in the depth to which the beds of the larger and smaller glaciers were then eroded is a perfectly normal feature of valleys once occupied by glaciers, and only departs from the rule of river valleys by its greater dimensions. In the neighborhood of Biasca, the glaciers of the smaller side valleys were of moderate size; the trunk glacier rose so high in the main valley that the small lateral glaciers may have been almost held back as stagnant ice lakes, comparable to the lateral water lakes that occupy tributary valleys near their junction with the main stream on the lower Danube, and again on the Red River of Louisiana. If such was the case, the side valleys must have been very little deepened by glacial erosion, while the main valley was scoured two or three hundred metres deeper than it was in preglacial times, thus producing the discordance that is now so striking.

Normal as these discordant beds were to the glaciers that scoured them, they are most abnormal to the streams that occupy them to-day; and a long time must pass before a new adjustment of trunk and branches can be brought about.

When glacial valleys and river valleys are properly compared, their corresponding parts are found to be closely homologous; the apparent contrasts between them are due to the unlike proportions of their parts, and to the fact that the beds of ancient glaciers are now exposed to view, while river beds are seldom seen or thought of. A river moves quickly; the cross-section of its channel is therefore but a very small part of its valley; the valley receives nearly all of our attention. Glaciers move slowly; the cross-section of the channel filled by their sluggish current may be a large part of their valley; and however little attention we may give to the invisible channel where glaciers still exist, much attention is given to the channels of extinct glaciers, for these constitute the most accessible parts of glaciated valleys.

It may thus be understood that it is not altogether appropriate to say that glaciated valleys are U-shaped in cross-section, while

river valleys are V-shaped. For, leaving aside the case of mature U-shaped river valleys, it should be recognized that a river channel has a broad U-shaped cross-section at the bottom of its V-shaped valley, as in fig. 5, and that a glacier has a

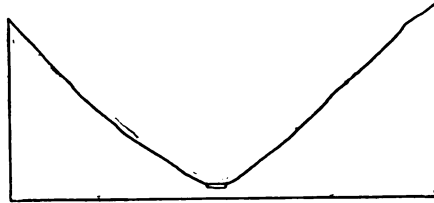


Fig. 5. A river channel in a V-shaped valley.

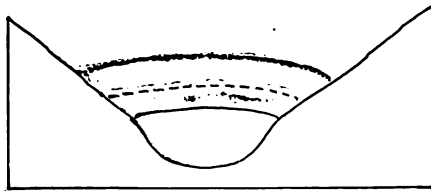


Fig. 6. A glacial channel in a V-shaped valley.

V-shaped valley above its U-shaped channel, as in fig. 6. Hence here, as before, the corresponding parts of river valleys and of glacial valleys are similar, although of different proportions. Not only so; while many an abandoned glacial channel (like that of the Ticino) is deep U-shaped, a glacier tends to develop a channel of a very broad U-shaped cross-section;

and the reason that we do not more frequently see such forms is that the glacial period did not last long enough for their production. On the other hand, the U-shaped section of a river, ordinarily broad and shallow, is sometimes comparatively narrow and deep; but such forms are not very common because they occur only during the brief early youth of rivers; and most of the rivers that we study are near or in their maturity.

The analogy first drawn between the movements of rivers and glaciers some fifty years ago is thus coming to be extended to many other features. Glaciers of high latitudes, which creep down their valleys and enter the sea, correspond to ordinary rivers. Glaciers of middle latitudes, which end by melting on the flanks of the mountains whose summits gather their snows, correspond to rivers that end in deserts beneath mountains whose summits gather their rains, as has been pointed out by Forel; both of these special kinds of drainage are determined by the climatic peculiarities of their basins. Erosion in the upper reaches, deposition in the lower, characterize both. The secular changes in the length of valley glaciers, due to changes in their

supply of snow, corresponds to the short-lived variations in the length of desert rivers, following changes of rainy and clear weather. A further step in the analogy might be made by considering, on the one hand, the glaciers which descend from lofty mountains and spread out, paw-like, over piedmont lowlands, with many oscillations of their area during a complex glacial period, and on the other hand the torrents and sheetfloods of the Sonoran region, and their changes with the weather, as has been so well described by McGee. Meunier has suggested that the headward erosion of one glacier in its cirque may capture and direct the upper ice of a higher standing glacier, after the habit of rivers. But of all these comparisons that one is most luminous which correlates the channels of glaciers and of rivers, and shows that hanging valleys are normal features under the climatic conditions that produced them, however abnormal they are under the climatic conditions that now exist. Thus understood, hanging valleys must come to have a great value in the study of glaciated mountains as a ready means of determining the minimum depth of the ice and a rough measure of glacial erosion in the main valley, as may be so well learned in the beautiful valley of the Ticino.

EXPLANATION OF THE PLATES.

PLATE XV.

1. *Looking across to Val di Lodrino.*

A view taken from a point several hundred feet above the floor of the main valley of the Ticino, looking across past Osogna station to the hanging Val di Lodrino, an excellent example of its class. The stream from this side valley is hidden in the deep cleft that it has cut in the wall of the main valley. The village of Lodrino stands on the alluvial fan formed at the base of the cleft. The broad gravel bed of the side stream extends forward to the channel of the Ticino.

2. *Valley of the Ticino.*

A view taken looking north, up the valley of the Ticino from Osogna towards Biasca, from same point as Fig. 1. Note the contrast between the broad and flat valley floor and the steep rock wall on the right. The curve in the railway at Osogna is made around a flat fan formed by the stream from the hanging Val d'Osogna (not here shown). The distant mountain stands in the angle between the Val Levantina and Val Blenio, which unite at Biasca.

3. *Looking up to Val d' Ambra.*

This is one of the most impressive of all the hanging valleys in the region. Notice the abruptness with which it is cut off by the steep walls of the main valley. The side stream descends by many cascades in a narrow cleft, cut into the face of the main valley wall.

PLATE XVI.

1. *Looking up to Val Cremosina.*

A characteristic view of a hanging lateral valley as seen from the floor of the main valley, taken from near Bodio, looking west. The stream from the hanging valley at first leaps over a rock cliff, and then cascades down over a rock slope littered with a talus of fallen blocks.

2. *A rock fall below Bodio.*

Since the withdrawal of the ancient glaciers from the valleys that they deepened, many rock falls have occurred. In this view, taken from the mouth of the hanging Val d' Ambra, the niche left by the fall is seen at the top of the basal cliff of the main valley wall; a part of the sloping bench above the cliff has been broken away. The fallen rock now forms a cone of huge blocks at the side of the main valley floor. Fig. 8 in Plate XV. was taken from near the top of this cone. The village in the foreground is Personico, surrounded by vineyards with stone posts.

3. *Crossing fans in upper Gasterthal.*

Looking down the Gasterthal, a branch of the Kanderthal in the Bernese Oberland. A high-level hanging valley is seen in the distance on the left; large fans of coarse postglacial alluvium occupy the foreground. Many Alpine valleys, over-deepened by the ancient glaciers, are to-day being clogged in this manner by the rapid supply of rock waste from side ravines.

The Great Glacier of the Illicilliwaet.¹

BY GEORGE AND WILLIAM S. VAUX, JR.

Read February 14, 1900.

OWING to its geographical location, there is probably no glacier in North America that is so situated as to be visited by so many people, both scientific and unscientific, as the Illicilliwaet Glacier. In the heart of the Selkirks, amid surroundings which attract the lover of nature and the mountaineer, the globe-trotter and the health-seeker, its close proximity to one of the most desirable of the transcontinental railways makes it easily accessible during the whole summer season. Its distance from the well-known Glacier House on the Canadian Pacific Railway is about a mile and three-quarters, over an excellent trail, which takes one through a magnificent British Columbia forest (a delight in itself, without the superb mountain surroundings), with which so many of the readers of APPALACHIA are personally familiar. It seems to us, therefore, to be a matter of importance and interest that as complete data as possible should be preserved relative to the Illicilliwaet Glacier. The

¹ The authors prefer "Illecellewaet," but accept for the sake of uniformity the spelling at present employed in APPALACHIA.



THE ILLICILLIWAET GLACIER.

From a Photograph by G. and W. S. Vaux Jr.

many problems involved in any of the theories of glacial action are fraught with difficulties, and it is only by the accumulation of many facts gained by careful and accurate observation that the truth can be gleaned.

We have visited this region during five different summers, 1887, 1894, 1897, 1898, and 1899. On each of these occasions we have taken numerous photographs of the glacier, and in addition have made measurements and other observations, including a trigonometric survey of the forefoot and its surrounding moraines.

Others have of course worked in the same field, and some of our earlier data have been obtained from them. Wherever possible to do so, we give credit to the gentlemen of whose work we have availed ourselves. It is a cause for regret, however, that, so far as we can learn after very careful investigation, a number of those who have marked rocks left no clue as to just what their marks meant, or who made them. With the obliteration caused by the years that have elapsed, some of the records have been lost entirely, and the full import of others cannot be definitely determined. The minute-book now kept at the Glacier House can be made of great scientific value in the future, if other observers will enter in it a brief statement of their work on the glacier.

Our work has divided itself under four general headings:—

1. Measurement of rate of flow.
2. Measurement of rate of recession.
3. A photographic record from the same fixed point for a number of years.
4. The mapping of the forefoot, streams, and moraines.

Before considering these several lines of investigation in detail, some general observations may not be amiss.

So far as any records show, when Rogers Pass was discovered in 1883 by the engineer from whom it has its name, his party were the first white men who ever set foot in this wild region, then all but inaccessible. Even the indefatigable Dr. Hector of the Palliser Expedition¹ had not penetrated so far. The amount of work accomplished by this expedition has quite properly aroused the wonder of the modern explorers.²

¹ See Professor Norman Collie, *The Geographical Journal*, vol. xiii. page 345

² Mr. Walter D. Wilcox in his delightful book, *Camping in the Canadian*

Having accomplished his mission in finding four passes on British soil across the Rocky Mountains proper, Captain Palliser's work was done without invading the Selkirks. Hence it is that, so far as we have been able to discover, there is nothing known of this immediate vicinity of which we are speaking, prior to 1887, since which the Canadian Pacific Railway has been in regular operation through the mountains.

As already remarked, our first visit to the Illicilliwaet Glacier was in 1887, on July 17. It was then known as "the Great Glacier," and no other title was heard for it, though some years later we found that it came to be generally called by the present title, after the name of the stream flowing from it.

At that time the forefoot of the ice extended across the comparatively flat bed-moraine to the ridge of boulders forming a small moraine, among which the alder bushes are now growing. A considerable number of these bushes were growing there then, thus proving that for quite a period the ice had advanced no further than the position in which we saw it on that occasion. Just within this moraine, and running nearly parallel to it, is a series of good-sized boulders daubed with tar. These were marked August 13, 1888, by the Rev. W. S. Green, author of *Among the Selkirk Glaciers*. They are marked "T," "T," on the map. These boulders, together with Mr. Green's photograph taken that year, show that but little recession occurred during the preceding twelve months. At the time of our visit in 1887, the ice rose above this moraine as an almost perpendicular wall many feet in height, thus indicating that a period of advance had been going on for some time previously. The marked recession which has occurred since then has naturally given the whole vicinity of the forefoot a very different aspect.

Rockies, New York, 1896, makes the statement that the report of the Palliser Expedition was published by the British government, but is now "unfortunately so rare as to be practically inaccessible to the general reader." One reason for this has been that persons searching for the work have not known how to find it. It is contained in three different volumes of British Blue Books, the preliminary reports being known as *Accts. and Papers, Colonies No. 22, 1859, Session 2*, and *Accts. and Papers, Colonies No. 44, 1860*, and the final report, a volume of some 325 pages, is *Accts. and Papers, Colonies No. 39, 1863*. The principal maps and index were not published till two years later. The reports were also issued separately, and can occasionally be found in the second-hand bookstores both in London and in this country.

Measurements of rate of flow. — In 1888, Rev. W. S. Green¹ attempted to measure the rate of flow of the Illicilliwaet Glacier. His results were not very satisfactory, however. His method was to drive stakes into holes bored with an auger into the ice, but the rapid surface melting caused them to topple over, and, when he returned to remeasure, it was impossible accurately to locate where they would have been if still standing. Profiting by his experience we provided ourselves with a number of steel plates six inches square and one-eighth inch thick, in the centres of which holes were bored and threaded to receive pieces of three-quarter inch gas pipe, three inches long. The original intention was to use the pipes as sockets to hold light flag-staffs, and they were made movable for ease of packing and carrying. In practice, however, it was found that it was much better to invert the plates, and use the pieces of pipe as spurs to hold the plates in position in the ice. The plates were all painted vermilion, and lettered and numbered in white for identification.

Owing to its greater height, the left or western moraine would be that naturally chosen for the stations from which to make the observations on which we were engaged. From personal experience in climbing it, however, we had discovered it to be very unstable, and in addition it rests upon a foot of ice, and is therefore constantly slipping down.

Having carefully reconnoitred the ground, a point was selected on the right moraine, which is quite old and stable, about 1500 feet above the snout of the glacier, and here, on July 31, 1899, we set up the transit. The position is probably as good as any that can be chosen. A large flat boulder, unlikely to be moved for many years, served as our station; a good back sight could be obtained on a ledge of rock about 200 feet to the east, and was there marked by a chisel line cut into the rock, whilst a prominent tree of considerable size upon the side of Glacier Crest served for the sight at the far side of the glacier, which is here about one-third of a mile across. At this point, just below the ice fall, the glacier is comparatively smooth, and our plan was to fix one of the plates every 250 feet. This was found not to be practicable, however, owing to the rolling charac-

¹ Among the Selkirk Glaciers, page 218.

ter of the surface of the ice. Even from the exalted point of observation on the moraine, the valleys running at right angles to the line we were laying out interfered seriously with the observations, and necessitated the locating of the plates at points whence they could be seen from the instrument. In most cases one plate could not be seen from the others. We accordingly decided to abandon all actual measurements of distances, and, having adjusted the plates in line across the ice, to lay out a base line on the moraine, and locate each plate by triangulation. This plan worked well, and eleven days later we were enabled when measuring to employ two transits, one at each end of the base line, and thus save a great deal of time and trouble. In this way eight plates were laid out across the glacier. On August 11 the bearings of each of the plates were again taken, and at the same time the exact movement of the plates was accurately measured from the direct line in which they had been originally laid out.

TABLE SHOWING MOTION OF LINE OF PLATES ACROSS ILLICILLIWAET GLACIER, BRITISH COLUMBIA.

JULY 31 TO SEPTEMBER 5, 1899.

Number of Plate.	Feet from North Border.	Dates of Observation.	Motion since last Obs. (inches).	Days since last Observation.	Motion per day (inches).	Average of all Obs. (inches).	REMARKS.
1	265	July 31 August 11 Sept. 5	on line 42.5 31.5	- 11 25	- 3.86 1.26	2.56	{ Plate was bedded in hard ice. In 5 days top sloped 80° to horizontal.
2	500	July 31 August 11 Sept. 5	on line 40.0 104.0	- 11 25	- 3.64 4.16	3.90	{ Plate bedded in hard ice. Sloped as above.
3	605	July 31 August 11 Sept. 5	on line 75.0 105.0	- 11 25	- 6.82 4.20	5.51	{ Plate bedded in soft ice. Was turned completely over on Aug. 11.
4	750	July 31 August 11 Sept. 5	on line 74.5 lost	- 11 25	- 6.77 -	6.77	
5	845	July 31 August 11 Sept. 5	on line 71.5 140.5	- 11 25	- 6.50 5.62	6.06	
6	980	July 31 August 11 Sept. 5	on line 76.5 165.5	- 11 25	- 6.96 6.62	6.79	
7	1040	July 31 August 11 Sept. 5	on line 60.0 172.0	- 11 25	- 5.45 6.88	6.16	
8	1310	July 31 August 11 Sept. 5	on line 66.0 lost	- 11 25	- 6.00 -	6.00	{ Total width of glacier at this point, 1720 ft.

In all this work we were materially assisted by Mr. E. J. Duchesnay of Revelstoke, B. C., who loaned us the instruments and gave us much valuable advice. Through his courtesy the positions of the plates were again measured upon September 5 by Messrs. H. B. Muckleston and C. E. Cartwright. All of these measurements, with some other data, are included in the table on the preceding page.

In plotting the accompanying map we have laid down the original position of the plates, and the new position upon September 5 only, as the amount of movement upon August 11 was too small to be indicated upon the reduced scale. As compared with Mr. Green's observations of 1888, our measurements show a very much less rate of flow. He gives the rate near the centre (l. c.) as 20 feet in 12 days or 20 inches per day, just about three times as great as our results. It will be observed that the rate on the left side is much greater than on the right. This is in accordance with theory, as the line of observation crosses the glacier where it is sweeping around on a great curve to the right, and naturally the convex side moves more rapidly.

Unfortunately, on September 5 plates Nos. 4 and 8 could not be found. All the plates were left on the ice, and it is much to be hoped that they can be located another summer and this most interesting investigation made more complete.

In addition to the row of eight plates across the glacier, another one, No. 9 (see map), was placed a few feet above the tongue, and measured at frequent intervals. At this point the surface of the ice sloped at an angle of about 40° , and a conveniently located crevasse afforded the opportunity of measuring the vertical height of the plate above the ground moraine. Its distance from a marked rock near at hand was also easily noted with the tape line. For several days these measurements gave most satisfactory and even results. Then the great mass of ice upon which the plate was placed broke off from the main body of the glacier. Immediately, as will be seen by the table on page 162, the daily rate of flow changed from a little over five inches to a fraction under three inches, and remained almost constant. Whether this apparent motion was due to the melting of the plate into the ice, or to the reduced flow of the mass when not urged on by the parent glacier, we did not discover. The

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TABLE OF MOTION OF PLATE NO. 9.

ON TONGUE OF ILLICILLIWAET GLACIER, BRITISH COLUMBIA, AUGUST 1 TO 20, 1899.

a. Number of Observation	1	2	3	4	5
b. Date of Observation	Aug. 1	Aug. 2	Aug. 6	Aug. 15	Aug. 20
c. Hour of Observation	10.50	16.30	10.35	16.35	16.30
d. Perpendicular dist. of plate from fixed pt. (inches)	195	195	177	122	112
e. Direct distance of plate from fixed point (inches) .	457	450.5	426	381.5	365.5
f. Horizontal dist. of plate from fixed point (inches) .	413.3	406	387.5	361.4	347.9
g. Interval since last measurement (days)	1.24	3.75	9.25	5.0	
A. Actual horizontal motion of plate (inches)	7.3	18.5	26.1	13.5	
i. Motion of plate per day (inches)	5.9	5.0	2.8	2.7	

The plate was securely anchored in the ice by means of the pipe prong. The slope of the glacier at this point was about 40°. All measurements were made with wire tape, the vertical (d) being obtained by dropping the tape to the ground moraine below through a crevasse. Measurements were made from marked boulder below tongue. Between Observations Nos. 3 and 4 a crevasse opened above plate, cutting off an immense block from the main glacier. This accounts for the decreased rate of flow in last line.

crevasses surrounding this smaller detached piece seemed to widen from day to day, notwithstanding the fact that the motion of the ice alone would have caused them to become narrower.

Measurement of rate of recession.—Our data for these determinations consist of the photographs taken by ourselves and others; the observation of prominent rocks situated in the moraines and marked by many different persons; and our own measurements.

On approaching the glacier by the trail, as the visitor emerges from the alder scrub and crosses a narrow ridge of moraine, there is on his left a large angular block of quartzite called by us "Rock E." In 1887 this rock was partly buried in the high ice wall above mentioned. It is a prominent object in one of our photographs, and with the aid of this picture we were able in 1898 to definitely fix just where the ice had crossed that rock eleven years previously. This point has been marked by a band of dark brown paint, and lettered "Edge of ice, VII. 16. 1887." It is now some 400 feet to the nearest ice. The casual visitor who is not acquainted with glacial phenomena thus has immediately called to his attention how rapidly this glacier has been shrinking during the last dozen years. The intervening space is nearly level ground-moraine and is covered with loose boulders. Upon it the alder bushes have not yet strayed. As

the small ridge of moraine in which "Rock E" is situated is well grown up with them, it is conclusively proved that many years have elapsed since the glacier advanced further than that point. A little higher up, on what is practically a continuation of this moraine, are scattered stunted evergreens. These latter average about 29 years of age, and the alder bushes on the lower moraine about 23 years. It is therefore evident that a considerable period has elapsed since the glacier occupied more space than it did when we first saw it in 1887.

In the centre of the stream flowing from the glacier, and not far from the moraine of 1887, is a long, flat boulder ("S" on the map), and which is lettered "16 feet from nearest ice, '90." We have been unable to find out who did this marking, but presumably any one who took the trouble to do so did it with approximate accuracy. We have taken this boulder for the basis of our measurements of recession. On August 17, 1898, several rocks were selected all of which were located by the prismatic compass, and these have since been incorporated in the survey. The rocks "B," "D," and "C" were chosen because their size and position gave promise of their remaining long undisturbed. On August 17, 1898, a line drawn from "B" to "D" ran 18 inches below the extreme point of the snout. "B" is a large rock on the left moraine, with a triangular black mark on the north side. It was lettered with red paint, $86-41-III A >$ |
 "D" is a yellow rock on the bed moraine, split $VIII-17-'98 >$ |
 into halves. One piece was lettered, "Rock opposite lines with snout, VIII-17-'98," and on the side opposite with a vertical line and two arrows.

In addition to these a large rounded boulder, "C," was chosen. It lies in the bed-moraine below the tongue, and was marked "60'. 0" to snout VIII-17-'98," and with arrows.

The summer of 1898 was a very warm one. On October 25 of that year Mr. Hugh B. Walkem of Vancouver, B. C., visited the glacier and found that there had been an additional recession since our visit of 46 feet in an interval of 68 days, an average of over eight inches per day.

We have found it difficult to secure other accurate data besides those already referred to from which the annual recession may be determined. Taking the rock "S," however, the glacier

showed a retreat of 452 feet in eight years, or an average annual recession of 56 feet. How little may be predicated from such measurements is proved by the fact that our own measurement made on August 17, 1899, shows a recession of only 16 feet during the previous year. In other respects, also, the glacier showed last summer signs of more activity. A careful comparison of our "test" photographs indicates that on the higher levels in some places the ice is markedly thicker. May it be that a period of advance is about to set in? We await future developments with much interest.

One peculiar phenomenon we think is deserving of attention. In the centre of the ridge of the high but unstable left moraine are two striking depressions. These are indicated on all the photographs we know of showing this moraine, and whilst these are becoming less noticeable through disintegration, they still appear prominently. We believe that they are of considerable significance, and that they mean that this great moraine is in reality a double one, and that in these places the second ridge has not been pushed over quite so far as the first. A similar state of affairs exists, though in much less degree, at one point on the right moraine, but can be seen only when standing just at the spot. There appears to be no foundation from which to argue as to how long after the first moraine was built up the second was pushed against it. The great height of the right moraine and the distance down to the ice from its summit indicate that the period was not inconsiderable.

It is pretty generally noted that all the glaciers of this district have been retreating recently. Whether there is a general change in climate, greater dryness, or greater warmth, there are no observations covering a long period of years to show. May it not be that the forest fires which have ravaged the northwestern mountains have produced some effect upon the rate of precipitation, and thus had an influence? We throw this out merely as a suggestion.

Whilst there is scarcely any information about it, surface indications lead us to believe that the Asulkan Glacier, fed to some extent from the same *névé*, and situated in the next valley to the west from the Illicilliwaet, has not receded recently so rapidly as its neighbor. It does not come to so low a level, however, and future observations may show us to be mistaken.

This whole subject of recession naturally brings up for discussion the question of how long it has been since these two glaciers, united as one, swept as a magnificent ice-stream down into the valley of the Illicilliwaet River far below where Glacier House is now situated. Old moraines abound through the woods, and certainly in former days both ice-streams were far greater than now. Professor Albrecht Penck, in his paper "*Der Illecellewaetgletscher im Selkirkgebirge*,"¹ indicates that he considers it possible that some centuries have elapsed since such a condition of affairs as the meeting of the Illicilliwaet and Asulkan may have occurred. This certainly is not an overestimate. There are hundreds of trees of great size growing in both valleys. By counting the rings of others close at hand which were cut down, we have proved them to be from 250 to 300 years old. In answer to an inquiry Mr. William M. Canby, the well known botanist of Wilmington, Delaware, writes under date of July 10, 1899: "To obtain the age of any tree on this continent, I should feel entirely safe in counting the rings. Rarely it might be that a tree would make no growth in some peculiar year, but this is not at all probable." Neither can the Indians throw any light upon the time of the meeting of the glaciers. They rarely if ever penetrated these mountains, and traditions on the subject are apparently wanting among them. In fact, this glacier is said to have been their hell.²

Of the rest of our work but little need be said. The photographic record we are endeavoring to keep up from year to year, and make as complete as possible. The survey of the forefoot with its surrounding moraines and the location of the streams as they existed in August, 1899, will, we believe, prove of interest.

Our special acknowledgments are particularly due to Mr. E. J. Duchesnay, Division Superintendent of the Canadian Pacific Railway, Revelstoke, B. C., for his coöperation and timely interest; and to his assistant, Mr. C. E. Cartwright, for invaluable work on the survey; also to Edouard Feuz, of Interlaken, whose skill on ice and rock did much to aid us in critical places.

¹ Zeitschrift des Deutschen und Oesterreichischen Alpenvereins, 1898, Vol. 29, page 55.

² Skinner, Myths and Legends beyond our Borders, p. 26.

The Seventh International Geographical Congress.

BY HENRY G. BRYANT.

Read February 14, 1900.

SOME twenty-eight years ago the growing interest in geographical studies in Europe induced a desire for international coöperation among students in this branch of knowledge. This feeling found expression in the first international congress, which assembled at Antwerp in 1871. Subsequently these meetings have been held with increasing success, at periods varying from two to eight years, successively at Paris, Venice, Paris, Berne, London, and Berlin. The recent session at Berlin, which lasted from September 28 to October 4, was a notable gathering and reflected eminent credit upon the Geographical Society of Berlin, which organized the congress. In point of numbers, it exceeded all former gatherings, the complete membership, including associates, reaching a total of 1667. Judged by the amount of work done, the importance of the subjects considered, and the bountiful hospitality shown, it will rank as one of the most successful meetings thus far held. The sessions convened in the hall of the new Prussian House of Deputies, an edifice whose noble proportions formed an admirable setting for the deliberations of the congress. Government and municipal patronage was extended to a marked degree and added greatly to the social success of the gathering. An instance of civic hospitality in this connection was the dinner given by the city of Berlin, for which the sum of ten thousand dollars was appropriated, and at which no less than twelve hundred guests were present. The large preponderance of Germans at the congress attested the popularity of geography as a factor in education in the Fatherland, and in itself was an object lesson to delegates from those countries where geographical studies have not yet reached the same high plane of recognition. The representation from England and America was relatively large — these English-speaking countries contributing 60 members to the 205 foreign delegates in attendance. The United States was represented by some fifteen members. A conspicuous absentee in the American delegation was the venerable Judge Charles P. Daly,

whose lamented death preceded by a few weeks the assembling of the congress. A pleasing adjunct of the meeting, and one much appreciated by the lady members from a distance, was the entertainment committee of ladies, who looked after the welfare of the wives of delegates and other associate members. By this means, invitations to functions of a social character at the houses of representative Berliners were extended to the strangers, and they were thus enabled to enjoy the charms of private hospitality as well as the more formal entertainments provided.

Owing to the decided numerical preponderance of Germans, the German language was the one almost universally used in the meetings, and the proceedings, with few exceptions, were printed in the vernacular.

Every aspect of modern geography — in its most comprehensive meaning — was covered by the papers read, and many interesting discussions were held in the smaller rooms devoted to the sectional meetings. Glancing over the programme of the sessions, one is impressed with the number and importance of the papers relating to oceanography — a circumstance which shows the growing interest that is taken in this branch of research. In this connection, it may be noted that Dr. Nansen, who is as much of a hero as ever, gave an illustrated lecture on the oceanographical results of the Fram expedition; and the claims of this study were also recognized in the appointment of a commission to decide on a system of nomenclature to describe the different portions of the bed of the ocean. A number of interesting papers relating to exploration and travel were read, although in this respect, it must be admitted, there were no contributions which equalled in timeliness and human interest the discourses made at the London congress of 1895, by Mr. C. E. Borchgrevink and Slatin Pascha. Among other questions considered by the congress were: a resolution authorizing the construction of a map of the world on a scale of sixteen miles to the inch; the making of statistical population maps; international coöperation in securing data relating to drift ice; uniformity in thermometer scales; international seismological observations; more accurate estimates of the population of unorganized countries; and the adoption of an international bibliography of geography.

But unquestionably, the leading question at the congress was the consideration of Antarctic exploration; and, in view of the fact that England and Germany are each to send out well equipped expeditions to the South in 1901, the discussion of this topic by such well known authorities as Markham, Nansen, Drygalsky, Greely, and Murray was followed with intense interest by the assembled delegates.

The following papers were contributed by American members of the congress:—

The Geographical Cycle. Professor William M. Davis, of Harvard University.

Papers on different Departments of the Geographical Work of the United States Government. General A. W. Greely, Washington.

On the Plans of the Ancient American Cities. Mrs. Zelia Nuttall, Cambridge, Mass.

The Jessup North Pacific Expedition. Dr. F. Boas, New York.

Colonial Systems. Mr. Poulteney Bigelow, New York.

Observations on the Upper Atmosphere. Mr. A. Lawrence Rotch, Boston.

The Bluffs of the Missouri River. Miss Owen, St. Joseph, Mo.

Drift Casks to Determine Arctic Currents. Mr. Henry G. Bryant, Philadelphia.

The question of the meeting place of the next congress was left unsettled, as none of the delegates from the countries represented were authorized to extend a formal invitation. The final decision was therefore referred to the Permanent Committee. It was informally intimated that official requests for the next congress might be expected from St. Petersburg and Buda-Pest. There was, however, a marked disposition among the members to show due consideration for the claims of America in this connection. The present arrangement will allow time for the representatives of the American geographical societies to confer on this subject, and if sufficient support is forthcoming, they may extend an invitation to the geographers of the world to meet in the United States in 1903.

In this brief summary of the results of the Berlin congress, it

has only been possible to allude to some of the prominent questions considered at its sessions. Its proceedings show that geography is maintaining its position as one of the foremost instruments of modern scientific research, and such meetings as that recently held in Berlin must be regarded as helpful and stimulating to those devoted to this branch of learning.

Notes.

Pioneer Climbing in the Himalayas. Dr. W. H. Workman and Mrs. Fanny Bullock Workman, F. R. S. G. S., authors of several books of travel, accompanied by the noted Swiss guide Mattias Zurbriggen of Macugnaga, made an unusual record in the Karakoram Himalayas the past season. In July they spent eighteen days on the great Biafo glacier in north Baltistan, following it up for thirty miles to Snow Lake, which lies at 16,000 feet. Crossing this, they ascended the snowy Hispar pass (17,500 feet). Sir W. Martin Conway and party, with the guide Zurbriggen, made the first crossing of the Hispar in 1891. The Workman expedition is the second to visit this inaccessible ice-world, and the first to see and photograph the unnamed unexplored ice giants bordering Snow Lake and the pass. Mr. Conway crossed this portion in a snowstorm, and saw nothing. The lowest camp was at 12,800 feet, the highest on ice at 16,400 feet.

Returning to Askole, a village in Braldo, new coolies were taken for an exploring trip to a circle of snowy peaks adjoining the lofty Skoro La (pass), the upper passage from Shigar to Askole. Here moraine and glacial camps were made at 16,000 and 17,400 feet, and two virgin snow summits ascended. The first peak, which was partly rock and partly snow, was made from the lower camp in five hours. Photographs were taken on the highest summit, which is a narrow white horn, and a cairn built on the somewhat lower rock summit. In this a jar was placed, containing card with names of climbers, the name which they gave the peak, the Siegfried Horn, and height, 18,600 feet.

Three days later, from the upper camp, a higher peak, wholly of snow, was made. Two porters were with the party, which was roped from camp. After a short bit of glacier, the whole ascent to the narrow knife-like summit was over steep snow-fields. The top was reached between ten and eleven A. M., from which the grandest known and unknown peaks of this part of the Himalayas were visible, Nanga Parbat (26,600 feet), K² (28,250 feet), Masherbrum and Gusherbrum (each 26,000 feet), the lovely Golden Throne of the Baltoro glacier, and the endless unnamed but equally immense snow kings of the Biafo and Hunza regions. None of the party suffered from mountain sickness, although at that height (19,450 feet) any sudden exertion caused loss of breath. The peak was named Mt. Bullock-Workman. The height of both these peaks was taken from the average registered by two late construction aneroids, and was judged to be approximately correct when compared with the official height of the pass (17,000 feet). Mrs. Workman, a Massachusetts lady, has thus exceeded all previous high-climbing records for her sex, as Zurbriggen in his Aconcagua ascent did for his.

Sketch Map of the Rocky Mountains of Canada (Plate XIX). Through the courtesy of the Royal Geographical Society we are permitted to publish the

sketch-map of the Canadian Rocky Mountains, prepared by Dr. J. Norman Collie and Mr. George P. Baker, to accompany the article by the former which appeared in the *Geographical Journal* for April, 1899. It is the map to which reference was made in a review of that number of the *Journal* in the last issue of *APPALACHIA* (page 59), in the following terms: "It has a special interest to members of our Club, for the plotting of the base-line was done at the Chalet at Lake Louise in the summer of 1897, by P. S. Abbot, and the first field-work toward its execution was begun a year later by Messrs. H. C. Parker and C. T. Thompson, by whom it was then turned over to Mr. G. P. Baker, who carried it forward in his later trip with Dr. Collie." The map is issued as Plate XIX. of the present volume of our magazine. In case the edition is received too late to insert it in this number, it will be sent out with No. 3, which will probably appear early next autumn.

Report of the Recording Secretary for 1899.

ON January 1, 1900, the corporate membership of the Club was 1090. The losses during 1899 amounting to 81, and the accessions to 145, and two memberships having been revived, the net gain for the year was 66. The Honorary Members numbered 20, Judge Charles P. Daly and Sir Henry Rawlinson no longer appearing in the list, and Professor John Muir, Prince Luigi Amadeo di Savoia, and M. Joseph Vallot having been added. The Corresponding Members numbered 49, Mr. Henry S. Bryant and Mr. William Williams having been elected, and Professor O. C. Marsh having deceased. There were 124 Life Members. The total membership was 1159.

There were held during the year nine regular and four special meetings, and two sessions during the field-meeting. Several of the meetings were largely attended, the average attendance being 155. Room 11 in Rogers Building was often too small, and it was not always possible to adjourn to Huntington Hall. The Club has accordingly practically settled down in Room 22 in Walker Building. It is much better to have a regular abiding place, and therefore, for the present at least, this may be considered our home.

At the various meetings there were presented, besides reports of officers and committees, seventeen papers, thirteen of which were illustrated with the lantern. Canada had three papers, the West Indies two, and Massachusetts, New Hampshire, Florida, California, Alaska, Italy, and Russia, one each; there was one

paper on Botany, one on Physiography, and three were of a general character.

The field meeting was held at Deer Park Hotel, North Woodstock, N. H., July 1 to 10, the features of special interest being the Lost River and the "Joseph Story Fay Reservation." There was a very successful Camp in August on Mooselucmaguntic Lake, by far the largest camping party in the history of the Club. Accounts of these and other excursions will be found in the report of the Excursion Committee.

The Snow-shoe Section held its annual meeting in January. There was some very fine snow-shoeing near Boston, but only one meet was held independent of the Saturday Outings. The excursion was to the Iron Mountain House, Jackson, N. H., February 18 to 27, Washington, Carter Dome, and the Giant Stairs being among the mountains ascended. The party numbered 79. The membership of the section is 153.

The membership of the Alpine Section has not changed during the year. The Council has now under consideration questions concerning the future of the section.

The annual social meeting was held at the Hotel Vendome on Friday evening, February 10. The attendance was 233, and a balance of \$47.10 was turned into the treasury. Social meetings, with exhibitions of photographs, have been held at the Club rooms, and also several reunions of those who had attended excursions.

Attention is called to the reports of the various Councillors, the Committee on the Sella Collection, the Room Committee, and the Trustees of Real Estate for further information concerning the Club's history the past year.

One number of *Appalachia* was published, Vol. IX., No. 1, in May.

The only unusual event of the year was the generous gift to the Club from Mr. and Mrs. Edson C. Eastman, of about two acres of land on "Three Mile Island," in Lake Winnepesaukee, N. H. This will offer a pleasant camping-ground for members and friends.

Respectfully submitted,

ROSEWELL B. LAWRENCE,

Recording Secretary.

Report of the Corresponding Secretary for 1898.

THE Corresponding Secretary and Librarian is pleased to report the continuance of pleasant relations with more than one hundred societies and a gratifying growth of the library. The number of corresponding societies and exchanges is now 117, an increase of seven during the past year, the new ones being the Alpine Club, London; Club Alpin Français (Section de Pau, Basque, etc.); Institut Géographique de Bruxelles; L'Observatoire Météorologique du Mont Blanc; Geografiska Föreningen (Helsingfors); White Mountain Life and Among the Clouds. From these correspondents about 125 volumes of proceedings have been received. A few gaps in the early issues of some of the series now on our shelves have been filled, among them being the *Jahresberichten I.-IV.* of the Verein für Erdkunde, Leipsic, and the first volume of the *Mémoires* of the Société de Spéléologie. Of our new correspondents the Geografiska Föreningen has sent its four volumes of *Meddelanden*, the Observatory of Mont Blanc its three volumes of *Annales*, and White Mountain Life its complete issue of three volumes; while the White Mountain Echo has supplied the two volumes missing from its set.

The accompanying list gives the accessions to the library in detail. An analysis of it shows that, besides the exchanges, about 109 volumes have been added to the library, 22 by purchase, 14 the gift of author or publisher, and 73 the gift of members of the Club.

Besides these books, the Club has received 251 maps, all but two of which have been sent to it by the United States Geological Survey.

The most important gift of the year was that of the late Mrs. J. H. Thorndike, who presented Sven Hedin's splendid work, *Through Asia*, and the two volumes of Landor's well-advertised adventures, *In the Forbidden Land*. Mr. C. W. Folsom presented some sixteen volumes of travels and guide-books, and twenty-two books were given by the Librarian himself.

The customary new bookcase was put in place early in the spring, and still another will be needed before summer.

The work of cataloguing has been continued during the year,

and in this, as well as in the care of the periodicals, Miss Isabel Batchelder has continued her valuable voluntary assistance.

The use of the library by our members is increasing, the number of volumes taken for home reading being more than three hundred. This is but a partial measure of the usefulness of the library, for the periodicals are in constant demand for room use, and the books of travel are consulted to a very large extent.

EXCHANGES.

AMERICAN.

Academy of Natural Sciences (Philadelphia). — Proceedings, 1898, 3; 1899, 1, 2.

American Geographical Society. — Bulletin, XXX. 5; XXXI. 1-4.

American Museum of Natural History. — Bulletin, XI. 2; Report, 1898.

Blue Hill Observatory. — Bulletin, 1899, 1, 2.

Boston Society of Natural History. — Proceedings, XXVIII. 15, 16; XXIX. 1, 5; Memoirs, V. 4, 5.

California Academy of Sciences. — Occasional Papers, VI.

Essex Institute. — Reports, 1899; Bulletin, XXIX. 7-12.

Franklin Institute. — Journal, 147, 148.

Geological and Natural History Survey of Minnesota. — Bulletin, II.; Series, Part II.

Geographical Society of Philadelphia. — Bulletin, II. 4; By-laws, etc., 1899.

National Geographic Society. — Magazine, X.

Sierra Club. — Bulletin, II. 5, 6.

Smithsonian Institution. — Report, 1896, 1897.

Torrey Botanical Club. — Bulletin, XXVI.

United States Department of Agriculture. — Daily weather map; Bulletin of New England Weather Service, 1899; Annual Report of same, 1898.

United States Geological Survey. — Reports, XVIII. 1-4; XIX. 1-4, 6-6 contin.; Monographs, XXIX., XXXI., XXXV., and 249 atlas sheets.

FOREIGN.

ALPINE CLUBS.

Alpine Club. — Alpine Journal, 139-146.

Centra Excursionista de Catalunya. — Bulletin, 45-57.

Club Alpin Français. — Direction Centrale: Bulletin, 1898, 12; 1899, 1-11; Annuaire, 1898. Section de la Côte-d'Or et du Morvan. Bulletin, 1898. Section Lyonnaise. Revue Alpine, V. 1-12. Section de Pau. Bulletin Pyrénéen, 13-15. Section du Sud-Ouest. Bulletin, 44-45.

Club Alpino Italiano. — Direzione Centrale: Rivista Mensile, XVII. 12; XVIII. 1-11. Sezione di Milano. Panorama.

Club Alpin Suisse. — Jahrbuch, 1898-99 and Beilage; Alpina, VII. 1-12. Sections Romandes. L'Echo des Alpes, 1898, 12; 1899, 1-12.

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- Club degli Touristi Triestini.* — *Il Tourista*, VI.
Dansk Turistforening. — *Aarskrift*, 1899.
Deutscher und Oesterreichischer Alpenverein. — *Mittheilungen*, 1898, 23, 24; 1899, 1-23; *Zeitschrift*, XXXIX.
Kruimskij Gornui Klub. — *Bulletin*, 1898, 9-12; 1899, 1-8.
Magyarországi Karpát-egyesület. — *Jahrbuch*, 1899.
Norske Turistforening. — *Arbog*, 1899.
Oesterreichischer Alpenclub. — *Alpen-Zeitung*, 520-545.
Oesterreichischer Touristen-Club. — *Oesterreichische Touristen - Zeitung*, XVIII. 24; XIX. 1-24.
Siebenbürgischer Karpathenverein. — *Jahrbuch*, XIX., and *Beilage*.
Società Alpina Friulana. — *In Alto*, X. 1-6.
Società Alpina Meridionale. — *Bollettino*, VI. 4; VII. 1, 2; *Calendario*, 1898.
Società degli Alpinisti Tridentini. — *Annuario*, XX.
Società Alpina delle Giulie. — *Alpi Giulie*, IV. 1-5.
Société des Touristes du Dauphiné. — *Annuaire*, XXIII., XXIV.
Svenska Turistforening. — *Arsskrift*, 1899.
Thüringerwald-Verein. — *Monatsblätter*, VII. 1-9.

GEOGRAPHICAL SOCIETIES.

- Gesellschaft für Erdkunde.* — *Verhandlungen*, XXV. 8-10; XXVI. 1-6.
Geografiska Föreningen (Helsingfors). — *Meddelanden*, I.-IV.
Imperatorskoye Russkoye Geographicheskoye Obshtchestvo. — *Izvestiya*, XXXIV. 3, 4; *Otchet*, 1897.
Institut Géographique de Bruxelles. — *Publication*, I.
Instituto Geografico Argentino. — *Boletin*, XIX. 1-12; XX. 1-6.
Kais.-königliche Geographische Gesellschaft. — *Mittheilungen*, XLI.
Nederlandsch Aardrijkskundig Genootschap. — *Tijdschrift*, XV. 6; XVI. 1-5.
Royal Geographical Society. — *The Geographical Journal*, XIII., XIV.; *Year Book*, 1899.
Royal Geographical Society of Australasia, Queensland Branch. *Proceedings*, XIV.
Sociedad Geografica. — *Boletin*, XL. 4-12; XLI. 2, 3; *Revista*, 1899, 11-23.
Società Geografica Italiana. — *Bollettino*, III. ser., vol. XII. 1-12.
Société de Géographie (Paris). — *Bulletin*, XIX. 3, 4; XX. 1-3; *Comptes Rendus*, 1898, 8, 9; 1899, 1-6.
Société de Géographie Commerciale. — *Bulletin*, XXI. 23-24; XXII. 1-23.
Société de Géographie Commerciale de Paris. — *Bulletin*, XX. 12; XXI. 1-8.
Société de Géographie de Tours. — *Revue*, XVI. 1.
Société Khédiviale de Géographie. — *Bulletin*, V. 3; *Le Musée*.
Société Neuchateloise de Géographie. — *Bulletin*, XI.
Société Royale de Géographie d'Anvers. — *Bulletin*, XXII. 3, 4; XXIII. 1, 2.
Tokyo Geographical Society. — *Journal of Geography*, X. 118-120; XI. 121-127.
Verein für Erdkunde (Leipsic). — *Jahresberichten*, I.-IV. (1861-64); *Wissenschaftliche Veröffentlichungen*, IV.
Verein für Erdkunde an der Universität Wien. — *Berichte*, XXIII., XXIV.

REPORT OF THE CORRESPONDING SECRETARY. 175

OTHER EXCHANGES.

- American Forestry Association.* — XII. 1, 2.
Among the Clouds, XXIII.
Annales de Géographie, 37-42.
Boston Public Library. — Monthly Bulletin, 1899, 1-12; Annual Report, 1898; Codman Collection.
Commissionen for Ledelsen af Geologiske og Geographiske Undersøgelser i Grønland. — Meddelelser, 20, 21¹, 23¹.
Intelligence Division, War Office. — Geographical Index, Jan.-Nov., 1899.
Journal de Zermatt, IX. 1-20.
Journal of School Geography, III. 1-10.
Kais.-königliches Naturhistorisches Hofmuseum. — Annalen, XIII. 1-3.
Land and Water, IV. 1-6; V. 1.
Nova Scotian Institute of Science. — Proceedings, 2d ser. II. 4.
Oberlin College. — Agassiz Bulletin, 24-29; Laboratory Bulletin, 8, 9.
Observatoire Météorologique du Mont Blanc. — Annales, I.-III.
Park Commissioners of Lynn. — Report, X.
Revue Géographique Internationale, 277-288.
Société de Spéléologie. — Spélunca, 15, 16; Memoires, I. 1, 2, 4-11; III. 18-21.
Imperial University (Tokyo). — Journal, XI. 1-3; XII. 1-3.
Upsala Universitets Mineralogisk-Geologiska Institution. — Meddelanden, 16, 17, 24, 25; Bulletin, IV. pt. 1.
White Mountain Echo, XX., XXI., XXII.

DONATIONS.

[Names of members of the Club are italicized.]

- About Mushrooms. *J. A. Palmer, Jr.* Gift of *J. Ritchie, Jr.*
 Across Patagonia. *Lady F. Dixie.* Gift of *E. E. Norton.*
 Across the Continent. *S. Bowles.* Gift of *C. W. Folsom.*
 Across the Everglades. *H. L. Willoughby.* Gift of *Mrs. A. F. Cutler.*
 Aims and Methods of Cartography. *Henry Gannett.* Gift of *Maryland Geological Survey.*
 Alaska and its Resources. *W. H. Dall.* Gift of *Miss A. B. Caton.*
 Along New England Roads. *W. C. Prime.* Gift of *Miss I. Batchelder.*
 Alpinismo e la Scuola. *M. Cermenati.* Gift of the Author.
 American Traveller: Guide through the U. S. Gift of *C. W. Folsom.*
 Among the Tibetans. *I. B. Bishop.* Gift of *W. R. Davis.*
 Beyond the Rockies. *C. A. Stoddard.* Gift of *Harvey M. Shepard.*
 By Moorland and Sea. *F. A. Knight.* Gift of *G. D. Newcomb.*
 Cairo Fifty Years Ago. *E. W. Lane.* Gift of *Mrs. F. V. Fuller.*
 Carlsbad. *E. Kleen.* Gift of *J. Ritchie, Jr.*
 Chinese; their Present and Future. *R. Coltman.* Gift of *E. F. Stevens.*
 Corner of Cathay. *Adele M. Field.* Gift of *F. W. Stone.*
 Crags and Craters. *W. D. Oliver.* Gift of *E. W. Howe.*
 Excursions. *H. D. Thoreau.* Gift of *E. E. Norton.*
 Exploration of the Valley of the Amazon. *W. L. Herndon.* Gift of *J. Ritchie, Jr.*
 First Impressions of England. *Hugh Miller.* Gift of *J. Ritchie, Jr.*

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- Florida Days. Margaret Deland. Gift of *Cheever Newhall*.
 Forest Tree Planter's Manual. J. O. Barrett. Gift of *J. Ritchie, Jr.*
 Forests of Canada. Dr. R. Bell. Gift of Author.
 Fourth Annual Report of the Metropolitan Water Board.
 Glen House Book. C. R. Milliken. Gift of *Gardner M. Jones*.
 Guide to Chamonix and Mont Blanc. *E. W. Whymper*. Gift of Author.
 Guide to Commoner Butterflies of U. S. and Canada. *S. H. Scudder*. Gift of *E. E. Norton*.
 Guide to Zermatt and the Matterhorn. *E. W. Whymper*. Gift of Author.
 Guidebook to Norumbega and Vineland. E. G. Shepard. Gift of *J. Ritchie, Jr.*
 Guides. 10 volumes. Gift of *C. W. Folsom*.
 Heart of the Green Mountains. Gift of Rutland R. R.
 Heart of the South.
 Hints and Notes for Travellers in the Alps. John Ball. Gift of Publishers.
 Historic Storms of New England. S. Perley. Gift of *H. P. Curtis*.
 Illicilliwaet and Asulkan Glaciers. *G. and W. S. Vaux, Jr.* Gift of Authors.
 In the Forbidden Land. A. H. S. Landor. 2 vols. Gift of *Mrs. J. H. Thorndike*.
 Interpretation of Nature. N. S. Shaler. Gift of *Miss A. M. Patterson*.
 Jerusalem the Holy. E. S. Wallace. Gift of *J. Ritchie, Jr.*
 Journal of a Tour in Italy, 1821. Gift of *C. W. Folsom*.
 Journey from Constantinople to England. R. Walsh. Gift of *Miss I. Batchelder*.
 Korean Sketches. J. S. Gale. Gift of *J. Ritchie, Jr.*
 Land of Contrasts. *J. F. Muirhead*. Gift of Author.
 Land of Tawny Beasts. P. Mael. Gift of *F. W. Stone*.
 Life, Explorations, and Public Services of J. C. Fremont. C. W. Upham. Gift of *J. Ritchie, Jr.*
 Life of John Ledyard. J. Sparks. Gift of *C. W. Folsom*.
 Land of the Lamas. W. W. Rockhill. Gift of *J. Ritchie, Jr.*
 Leaves and Flowers. A. Wood. Gift of *W. R. Davis*.
 Lenox. G. A. Hibbard. Gift of *E. F. Sawyer*.
 Mammoth Cave of Kentucky. H. C. Hovey and R. E. Call. Gift of *J. Ritchie, Jr.*
 Manila and the Philippine Islands.
 Manuel du Voyageur. D. Kaltbrunner. Gift of *J. Ritchie, Jr.*
 Mexico, its Trade, Industries, and Resources. A. G. Cubas. Gift of *J. Ritchie, Jr.*
 Monuments of Upper Egypt. Mariette-Bey. Gift of *Miss A. B. Caton*.
 New Climbs in Norway. E. C. Oppenheim. Gift of *E. W. Howe*.
 Newport. W. C. Brownell. Gift of *E. F. Sawyer*.
 Pamphlet on Ferns. G. E. Davenport. Gift of Author.
 Peruvian Meteorology, 1888-1890. S. I. Bailey. Gift of Astronomical Observatory of Harvard College.
 Physiography and Geology of Region adjacent to Nicaragua Canal Route. *C. W. Hayes*. Gift of Author.
 Plutarch's Ancient Voyages to the New World. *Verplank Colvin*. Gift of Author.

Red River of Louisiana. R. B. Marcy. Gift of *C. W. Folsom*.
 Report on the Commercial and Industrial Condition of Cuba. R. P. Porter.
 Gift of *W. R. Davis*.
 Republic of Columbia. Gift of *J. S. Pray*.
 Round the Empire. G. R. Parkin. Gift of *J. Ritchie, Jr.*
 Russian Rambles. I. F. Hapgood. Gift of *J. Ritchie, Jr.*
 Sketches Awheel. F. B. and W. H. Workman. Gift of *W. R. Davis*.
 Sketches of Society in Great Britain, etc. 2 vols. Gift of *C. W. Folsom*.
 Through Asia. Sven Hedin. 2 vols. Gift of *Mrs. J. H. Thorndike*.
 Tour in Germany, etc., 1820-21-22. John Russell. Gift of *C. W. Folsom*.
 Tours in England, Ireland, Scotland, etc.
 Travels in South Africa. D. Livingstone. Gift of *J. Ritchie, Jr.*
 Travels, as follows, — 6 vols. Gift of *C. W. Folsom*.
 England, Holland, and Scotland. B. Silliman.
 England, France, Spain, etc. M. N. Noah.
 Italy in 1804-5. A. von Kotzebue.
 Sicily and Malta. M. de Non.
 Southeastern Asia. H. Malcom. 2 vols.
 Treatise on Pruning Forest and Ornamental Trees. A. des Cars. Gift of
 Massachusetts Forestry Association.
 Vagabond in Spain. C. B. Luffman. Gift of *Wm. T. May*
 Variations of Glaciers. H. F. Reid. Gift of Author.
 Wayside Sketches. E. J. Loomis. Gift of *A. R. Bailey*.
 Yesterdays in the Philippines. J. E. Stevens. Gift of *C. H. Waldo*.
 2 maps, gift of *J. Ritchie, Jr.*

PURCHASED.

Alps and Pyrenees. V. Hugo.
 British Central Africa. H. H. Johnston.
 From Cairo to the Soudan Frontier. H. D. Traill.
 Highest Andes. E. A. Fitz Gerald.
 How to know the Ferns. F. T. Parsons.
 In Northern Spain. H. Gadow.
 Impressions of Turkey. W. M. Ramsey.
 Observations of a Traveler. L. Lombard.
 On the Desert. H. M. Field.
 Our New Zealand Cousins. J. Inglis.
 Pictures from Bohemia. J. Baker.
 Summer Voyage on the River Saône. P. G. Hamerton.
 Tour on the Prairies. W. Irving.
 Travels in 1791 and 1792 in Pennsylvania, New York, and Vermont. J.
 Lincklaen.
 Voyages dans les Alpes. 4 vols. H. B. de Saussure.
 West African Studies. M. H. Kingsley.

Treasurer's Report for 1899.

The receipts and payments of the year were as follows :—

RECEIPTS.

Cash on hand, Jan. 1, 1899	\$513.77	
“ for Room Fund	153.00	
“ for Eliot Memorial Fund	86.00	
	<hr/>	\$752.77
Life-Memberships, 23 at \$30		690.00
Admission fees, 136 at \$5	680.00	
Assessments: 1 member for 1897		
4 members “ 1898		
782 “ “ 1899		
	<hr/>	
787 members at \$3	2361.00	
Interest:		
On Permanent Fund for 1898	150.62	
“ Reserve Fund “ “	37.98	
“ Treasurer's accounts for 1899	32.16	
	<hr/>	220.76
APPALACHIA and other publications:		
Sales of APPALACHIA and maps	51.99	
“ “ Walks and Rides	121.75	
Advertisements in Walks and Rides	60.00	
	<hr/>	233.74
Donations:		
For Library	25.86	
“ Rooms and Keys	332.50	
“ Use of Rooms	19.00	
“ Postage . . . . .	.02	
	<hr/>	377.38
Department of Art: Sella Collection	1.80	
Department of Topography: Sale of maps	16.34	
Annual Reception	47.10	
Field Meetings and Excursions:		
Received for Reserve Fund		75.00
Received from Committee	75.00	
	<hr/>	
Total unappropriated receipts		4013.12
		<hr/>
		\$5530.89
		<hr/>

PAYMENTS.

Trustees of the Permanent Fund	\$690.00
“ “ Reserve “	75.00
Postage and Stationery	272.47

TREASURER'S REPORT.

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Printing and Advertising	181.00	
Club Register for 1899	117.00	
	<hr/>	298.00
Clerical Services		241.00
Library:		
For Books	58.63	
" Binding	78.31	
	<hr/>	136.94
Expenses of meetings		166.83
Rooms:		
For rent and care 1049-51 Tremont Build- ing for 11 months	1033.12	
" Storage Warehouse	21.60	
" Lighting	24.64	
" Fittings and Supplies	81.48	
	<hr/>	1160.84
Department of Art		15.09
Department of Exploration:		
For Surveys	37.42	
" Aneroid Barometer	30.88	
	<hr/>	68.30
Department of Improvements:		
For Paths and Camps	244.89	
" Record Cylinders	75.00	
	<hr/>	319.89
APPALACHIA and other Publications:		
Vol. VIII., No. 4, reprints	26.80	
" IX., No. 1	629.05	
Delivery	78.00	
Business agent	50.00	
2d edition 2000 copies Walks and Rides . .	193.29	
E. M. Bacon, royalty on Walks and Rides .	27.90	
Commission for advertisement	2.50	
	<hr/>	1007.54
Real Estate		53.78
	<hr/>	
Total expenses		3740.68
Cash on hand, Dec. 31, 1899:		
Money unappropriated	789.21	
Room-fund and prepayments	150.00	
Eliot Memorial Fund	86.00	
	<hr/>	1025.21
		<hr/>
		\$5530.89
		<hr/>

Respectfully submitted,

RUFUS A. BULLOCK,
Treasurer.

RECEIPTS FOR FIRST TWENTY-FOUR YEARS.

YEAR.	MEMBERSHIPS.					Life Membership.	Sales of APPALACHIA and other Publications.	Interest.	Annual Reception.	Field Meetings and Excursions.	Donations.	Total.
	Admission Fees.	Yearly Assessments.	Back Assessments.	Advance Assessments.	Total.							
1876	252.00	....	....	....	252.00	....	43.13	....	....	....	....	295.13
1877	50.00	254.00	....	....	312.00	....	98.00	....	....	....	....	410.00
1878	54.00	264.00	....	....	318.00	60.00	75.70	....	....	....	43.00	496.70
1879	148.00	256.00	40.00	4.00	448.00	....	130.85	1.90	....	....	221.70	802.45
1880	178.00	332.00	24.00	4.00	538.00	90.00	116.90	10.79	....	....	86.21	841.90
1881	222.00	384.00	18.00	12.00	636.00	120.00	141.40	17.59	....	....	62.55	977.54
1882	256.00	528.00	74.00	....	858.00	90.00	309.43	22.07	....	....	2.00	1281.50
1883	395.00	1000.00	20.00	27.00	1442.00	210.00	197.58	39.72	9.72	82.88	22.00	2003.90
1884	285.00	1059.00	21.00	9.00	1374.00	60.00	93.51	53.29	26.80	11.47	1.00	1620.07
1885	375.00	1212.00	69.00	12.00	1668.00	60.00	113.19	61.09	.45	70.73	534.50	2507.96
1886	426.00	1317.00	90.00	24.00	1857.00	330.00	247.94	88.62	12.50	124.35	364.20	3024.61
1887	385.00	1491.00	90.00	42.00	2008.00	180.00	183.80	79.34	10.00	40.20	114.00	2615.34
1888	355.00	1536.00	117.00	12.00	2020.00	180.00	67.06	42.52	9.20	45.94	754.76	3119.48
1889	655.00	1617.00	69.00	27.00	2368.00	120.00	93.85	151.29	11.48	....	127.60	2872.22
1890	450.00	1620.00	24.00	15.00	2109.00	150.00	1168.13	217.12	3.73	....	220.85	3868.83
1891	500.00	1743.00	12.00	9.00	2264.00	120.00	354.28	182.54	....	146.27	20.00	3087.09
1892	560.00	1830.00	15.00	9.00	2414.00	300.00	625.22	130.29	....	70.58	.50	3540.59
1893	480.00	1908.00	6.00	....	2394.00	300.00	20.97	431.90	....	13.57	454.50	3614.94
1894	640.00	1968.00	9.00	12.00	2629.00	210.00	407.30	17.65	....	14.04	22.25	3300.24
1895	385.00	2016.00	6.00	12.00	2419.00	90.00	66.69	241.70	20.55	....	10.00	2847.94
1896	510.00	2076.00	6.00	42.00	2634.00	180.00	83.37	225.45	4.97	50.00	276.00	3453.79
1897	650.00	2094.00	18.00	15.00	2777.00	150.00	1197.87	251.48	....	155.00	451.18	4982.53
1898	670.00	2235.00	9.00	27.00	2941.00	420.00	668.70	198.80	35.09	80.00	508.75	4852.34
1899	680.00	2346.00	15.00	....	3041.00	690.00	251.88	220.76	47.10	150.00	377.38	4778.12
Total	9561.00	31086.00	760.00	314.00	41721.00	4110.00	6756.75	2685.91	191.59	1055.03	4674.93	61195.21

EXPENDITURES FOR FIRST TWENTY-FOUR YEARS.

YEAR.	Permanent Fund.	Reserve Fund.	Stationery, Postage, and Printing.	APPALACHIA and other Publications.	Department of Topography.	Improvements and Explorations.	Natural History and Art.	Clerical Expenses.	Expenses of Meetings.	Library.	Club Room.	Donations.	Total.
1876	....	....	109.91	140.86	....	15.00	....	....	....	....	....	....	265.77
1877	....	....	60.65	364.13	....	....	13.45	....	....	....	....	....	438.23
1878	....	....	202.31	169.80	2.00	20.00	52.48	....	....	....	....	....	446.59
1879	60.00	....	162.31	347.92	19.20	158.76	....	....	....	....	....	....	748.19
1880	90.00	....	186.17	318.13	19.00	72.60	....	....	....	....	....	....	685.90
1881	120.00	....	394.09	246.23	37.95	68.00	....	19.75	22.70	....	....	....	908.72
1882	90.00	....	258.99	675.93	25.40	....	....	34.50	25.00	....	....	....	1109.82
1883	281.72	....	389.73	366.27	123.65	160.37	....	67.41	1.38	69.78	....	....	1360.31
1884	113.42	....	382.49	1176.53	....	21.00	....	57.62	....	58.10	....	....	1809.16
1885	86.48	....	363.27	361.31	229.00	102.00	....	106.00	53.06	72.50	284.17	25.00	1682.79
1886	270.00	....	432.38	932.91	77.73	46.00	74.00	121.45	171.15	131.72	667.30	49.88	2974.52
1887	388.38	1000.00	289.38	566.71	538.97	123.02	20.12	107.12	145.45	102.50	504.81	....	3786.46
1888	280.00	100.00	473.95	597.59	....	779.55	8.32	49.50	93.45	120.56	456.12	....	2959.04
1889	220.00	114.70	390.77	1127.91	7.20	118.58	86.76	123.75	68.86	67.33	487.34	....	2813.20
1890	283.48	48.59	463.43	1682.95	....	46.07	101.56	181.00	58.35	96.06	464.95	....	3426.44
1891	305.64	605.71	389.27	833.17	50.00	123.00	45.36	191.50	121.60	117.10	471.69	105.30	3359.34
1892	399.56	200.00	438.72	1059.89	216.33	46.60	122.39	197.50	133.95	113.45	534.08	61.34	3523.81
1893	415.27	74.97	446.07	1086.18	....	684.15	664.45	221.95	203.70	59.10	576.04	25.00	4456.88
1894	210.00	....	398.49	947.59	....	228.75	74.48	236.80	194.14	89.66	540.28	25.00	2945.19
1895	90.00	79.22	462.75	571.57	164.43	205.35	109.78	249.75	157.05	128.56	493.90	25.00	2677.36
1896	180.00	*900.00	394.03	2418.28	40.99	337.08	47.62	248.00	180.05	139.99	855.48	25.00	4866.52
1897	150.00	*200.00	506.16	2473.97	....	387.82	79.11	258.50	171.13	142.10	1243.66	25.00	5237.44
1898	420.00	....	475.61	979.89	30.56	227.95	74.39	249.50	181.85	161.96	1280.93	....	4082.64
1899	690.00	75.00	570.47	1067.54	....	441.97	15.09	241.00	166.83	136.94	1160.84	....	4505.68
Total	5143.00	1198.19	8581.39	20453.26	1482.41	4413.62	1589.36	2962.60	2149.70	1807.41	10021.59	366.52	60170.00

* Decrease.

Report of the Trustees of the Permanent Fund for the Year 1899.

PERMANENT FUND. — PRINCIPAL.

1899.

Jan. 1.	Amount of Permanent Fund on hand per last account	\$4453.95
"	Amount of Interest on hand per last account	\$150.62
Feb. 6.	Paid R. A. Bullock, Treasurer, accrued interest of the year 1898, as per vote of the Council	150.62
		<hr/>
	Life-Memberships during year :—	
Feb. 7.	James H. Bowditch	\$30.00
"	Miss Isabel Batchelder	30.00
"	" Mary F. Cummings	30.00
"	Mrs. Alice M. Silsbee	30.00
Mar. 20.	A. Selwyn Lynde	30.00
"	Robert Brown	30.00
"	John F. Goode	30.00
"	Mrs. John F. Goode	30.00
June 1.	George Carew	30.00
"	George Vaux, Jr.	30.00
"	Miss Abbie B. Bates	30.00
June 28.	Arthur J. Knowles	30.00
"	Miss Mary Crane Hewett	30.00
July 18.	Henry S. Adams	30.00
Nov. 21.	Miss Charlotte B. Hall	30.00
"	" Angeline P. Nutter	30.00
"	Rev. William B. Fisher	30.00
"	Miss Edith S. Cushing	30.00
"	Warren F. Flint	30.00
"	Mrs. Emma S. White	30.00
"	Louis F. Cutter	30.00
"	Miss Leonora E. Taft	30.00
Dec. 29.	" C. Louise Smith	30.00
		<hr/>
		690.00
	Total Principal on hand January 1, 1900	<hr/> <hr/> \$5143.95

PERMANENT FUND. — INTEREST.

1900.

Jan. 1.	Suffolk Savings Bank : 12 months, to October, 1899	\$41.50
"	Provident Institution for Savings : 12 months, to July, 1899	46.32
"	Lexington Savings Bank : 12 months, to October, 1899	38.70

TRUSTEES' REPORT.

"	Eliot Five Cents Savings Bank : 12 months, to October, 1899	12.27	
"	Canton Institution for Savings : 12 months, to October, 1899	10.40	
	Total Interest accrued during year		<u>\$149.19</u>
"	Total Permanent Fund, principal and interest This is deposited in —		\$5293.14
"	Suffolk Savings Bank, Book No. 100,573 . .	\$1017.50	
"	Provident Institution for Savings, Book No. 118,265	1358.56	
"	Lexington Savings Bank, Book No. 1921 . .	996.83	
"	Eliot Five Cents Savings Bank, Book No. 32,233	731.18	
"	Canton Institution for Savings, Book No. 9015	456.69	
"	Boston Five Cents Savings Bank, Book No. 425,754	354.38	
"	Franklin Savings Bank, Book No. 70,143 . .	354.00	
"	Cash, interest on hand	24.00	
			<u>\$5293.14</u>

RESERVE FUND. — PRINCIPAL.

1899.			
Jan. 1.	Amount of Reserve Fund on hand, per last account		\$1123.19
"	Amount of Interest on hand, per last account	\$37.98	
Feb. 6.	Paid R. A. Bullock, Treasurer, accrued in- terest for the year 1898	37.98	
			<u>75.00</u>
Dec. 13.	From Excursion Committee, to be used by Committee, when so voted by the Council .		
	Total Principal on hand January 1, 1900 . .		<u>\$1198.19</u>

RESERVE FUND. — INTEREST.

1900.			
Jan. 1.	Boston Five Cents Savings Bank, 12 months, to October, 1899	\$28.56	
"	Massachusetts Loan and Trust Co.: 12 months, to January, 1900	9.42	
	Total interest accrued during year		<u>37.98</u>
	Total Reserve Fund, principal and interest .		\$1236.17
	This is deposited in —		
	Boston Five Cents Savings Bank, Book No. 229,173	\$912.56	
	Massachusetts Loan and Trust Co.'s note . .	323.61	
			<u>\$1236.17</u>

Total Permanent Fund, principal and interest	\$5293.14
Total Reserve Fund, principal and interest	1236.17
Total in hands of Trustees	<u>\$6529.31</u>

CHARLES H. FRENCH, } Trustees of the
 REST F. CURTIS, } Permanent and
 ISAAC Y. CHUBBUCK, } Reserve Funds.

BOSTON, January 10, 1900.

The Committee appointed to examine the accounts of the Appalachian Mountain Club respectfully report.

We have examined the accounts of the Treasurer for the year 1899, and believe them to be correct. Proper vouchers were shown for all payments, and the cash on hand was verified, amounting to one thousand and twenty-five dollars and twenty-one cents (\$1025.21).

We have examined the accounts of the Trustees of the Permanent and Reserve Funds, and find them to be correct.

The Permanent Fund amounts to five thousand one hundred and forty-three dollars and ninety-five cents (\$5143.95), and the accumulated interest on hand is one hundred and forty-nine dollars and nineteen cents (\$149.19), total, \$5293.14.

The Reserve Fund amounts to one thousand one hundred and ninety-eight dollars and nineteen cents (\$1198.19), and the accrued interest on hand is thirty-seven dollars and ninety-eight cents (\$37.98), total \$1236.17.

The investments, as reported by the Trustees, have been verified.

Respectfully submitted.

EDWARD W. HOWE, } Auditing
 CHEEVER NEWHALL, } Committee.
 FRED V. FULLER, }

BOSTON, January 8, 1900.

Report of the Trustees of Real Estate for the year 1899.

THE Trustees of Real Estate respectfully report as follows:

Most of the trees planted upon the Shelburne Reservation have lived and are doing well. The ground has been cleared from rubbish and enclosed by neat fences. Already it is beginning to regain much of its former beauty. We expect to put in place next year two or more appropriate signs.

The paths of the Randolph Reservation have been extended and improved, at the cost of one of the Trustees. No part of the mountains is more used than this reservation and its adjoining tracts, and in no part is it easier for the ordinary pedestrian to climb the mountain summits. In the summer the Councillor

of Topography issued a revised map of the northern slopes of Mounts Madison, Adams, and Jefferson, showing the points of interest and the several paths, distinguished into graded and other paths.

The occasion of the Field Meeting in North Woodstock gave to the members of the Club an opportunity to inspect the Joseph Story Fay Reservation. Its principal topographical feature is a ridge-like hill extending approximately north and south. The southern boundary of the forest tract is a little way south of the hill, and the northern boundary runs over the northern slope about half way between its summit and its base. The hill appears to be of glacial origin, there being no indication of ledge, but a great abundance of boulders, cobble stones, gravel, and sand. The western portion of the land is relatively low, part of it being actually swampy. The land within the village south from the sawmill has been cleared from rubbish and enclosed with a neat fence, and was much used by the community this past summer. The forest tract has been surveyed and in part fenced. Arrangements have been made for the getting out and sale of the trees which were blown down during the severe storm of November, 1898. Before the property came into the possession of our donor, Miss Sarah B. Fay, a portion upon the stage road to the Profile House was sold to the town of Lincoln as a lot for a schoolhouse which afterwards was used as a tenement house. Negotiations are in progress by which we hope this portion will be secured for the Club and taken within the limits of the Reservation.

Through the kindness of one of our members, Mr. John Charles Olmsted of Olmsted Brothers, the well known landscape architects, a thorough examination has been made of the land, and a plan given to us for its development, which in several of its features coincides with the conclusions arrived at by two of the Trustees who went over the land in the early spring.

The first problem which confronts us is the preservation of the natural beauties of the tract. This involves in the main protecting the land from damage by fire and by pasturage. The beauty also of the land may be increased at certain points, which now are bare, by planting trees and undergrowth, and at

some points by thinning out existing trees and undergrowth in a very gradual and cautious manner with a view to making more noticeable the more valuable growths.

If this tract is to be visited by increasing numbers of people, it will be necessary, not only for their convenience but for the protection from wear and destruction of the ground covering and undergrowth, to construct paths, steps, bridges, seats, and the like.

1st. A path that will be most immediately popular will be one leading to and around the island in the river and thence to the bridge near the sawmill. This path would best start at the southwest corner of the tract nearest the village. It should lead down the slope to the large boulder and group of trees, thence directly to the river bank; then turn and follow the river as closely as practicable all the way to the highway bridge at the sawmill, with a branch to the corner of the stage road. A small amount of thinning out of bushes and trees on the river bank will be desirable, to afford better views of the river. Trees should be planted west of the path to afford shade, especially in the afternoon. Near the lower end of the island, where the banks are higher than at the south end of the island, a rustic bridge should be thrown across the west branch of the river. A similar bridge should be thrown across the west branch at the upper end of the island.

2d. A path would be very desirable as an approach to the main body of the reservation from the west side of the highway. This path would enter the reservation at the southeast corner. The land here, and to a greater or less extent all along the southern boundary, is bare of trees, and as the hillside beyond is nearly clothed with spruce and fir it would be best to plant this small opening with these trees.

3d. Another river path can be started on the east side of the highway a little north of the sawmill where the river bends sharply toward the highway. This path may run down the steep slope diagonally, and after reaching the bottom it may turn sharply to the eastward or southeastward until the river bank is reached. It may then follow the river bank until it is forced back into the highway by the close proximity of the river to the highway. Further north, where there is again

some breadth of land between the river and the highway, the river walk may resume its course and may continue along the bank to the second bridge above the village. Some thinning of shrubbery and occasionally even of trees would be desirable on the riverbank to open up the views from the path. At particularly attractive spots seats should be provided, usually in the form of large logs.

4th. A path along the ridge of the hill is very desirable. The ridge path would start at the southeast corner entrance and run first, if practicable, up the little knoll directly north of this entrance. This spot may be called Balsam Knoll. The path would then turn sharply to the west for a short distance and then curve around a little valley to a huge boulder. This boulder is so noticeable for its size and picturesque surroundings that it should be utilized as a local centre of interest and a point to which several walks should be led. From this boulder the path should run northward, following generally the ridge line, but diverging to the right or left where views can be obtained by thinning the trees. At one point a little to the east of the ridge proper there is a remarkably large and broad-topped sugar maple to which the path should lead. Following the ridge, the path would enter an old wood, where it should be led as near as practicable to some of the largest trees. After passing the summit of the hill the path might bear to the northeastward to a point marked by a large boulder with a little basswood growing upon it. Here a platform with steps may be erected as a resting-place and to mark its importance as a view-point. The view up the Notch can be satisfactorily obtained by cutting here a dozen or twenty trees, and perhaps some other scattering trees further down the hill in the portion where there has been a windfall.

5th. There might be a path part way up the west flank of the hill and extending its whole length from the southwest entrance to the Notch View-Point.

6th. The eastern flank of the hill is rougher than the western flank. It is more broken by small cross ravines, is much steeper in some places, and much of it is covered with larger and more numerous boulders. The character of the woods, however, is distinctly different from those of the western

flank of the hill, and the large moss-covered boulders form numerous points of interest. A path will be desirable extending from the Big Boulder near the end of the hill to the Notch View-Point. In the first part of its course the path should be so run as to command a view which can be opened up from the cross ridges, especially one to the south not far north of the Big Boulder, and another back of the school-house which, with a little clearing, would then command the East Branch Valley. Between these two view-points there is a considerable number of remarkably fine sugar maples with particularly well-developed tops. Care should be taken to clear out interfering growths and to run the path near enough to those trees to afford a realizing sense of their magnitude and to take advantage of their shade. North of the East View-Point the boulders and occasional large and very tall yellow birch-trees form attractive features. Care should be taken to run the path close against the boulders where practicable, in order that their size may be fully realized by visitors.

7th. From the Notch View-Point it will be desirable to run a path down the slope and across the swamp in a generally northwesterly direction to connect with an existing wood road and paths to Georgiana Falls, Bog Pond, Wolf Mountain, and other points of interest. The character of the vegetation in the swamp is so different from that on the hill, and at the same time so beautiful, that it ought to be rendered accessible by some such path as this, even though the construction of the path may involve more expense than usual. Such a path might be built to resemble a corduroy road, only narrower and with smaller sticks laid crosswise on moderate-sized logs and spiked down. The southern part of the swamp is largely occupied by alders, though spruces are growing in considerable quantities and there are also some larches. By way of contrast with the wooded hill it might be desirable to permanently preserve this alder swamp from intrusion from any considerable number of trees. A few larches will be very desirable and characteristic, but perhaps nearly all of the firs and spruces would better be cut. West of the alder swamp there is some open pasture land where firs and spruces are springing up, and where it would be desirable to retain the bushy pasture character.

By way of announcing the existence of this reservation and the fact that it is a memorial to Mr. Joseph Story Fay, we suggest that on the big boulder on the western side of the highway north of the sawmill, the following inscription be carved :

FAY RESERVATION
Given to the
Appalachian Mountain Club
In Memory of
JOSEPH STORY FAY
1812-1897.

The gift of this land to our Club "was a most admirable way of creating a permanent memorial to a worthy citizen and to afford a most valuable and attractive pleasure ground for the citizens of North Woodstock, and for the growing number of summer visitors to it. The land is extremely charming in its natural characteristics and commands numerous beautiful mountain views."

Rev. John Edgar Johnson of Philadelphia proposed to transfer to the Club his property at Mountainside in North Woodstock, consisting of the farmhouse and furniture, six cabins, the house near the Agassiz Basins, and the land, upon terms which required the Club to make certain expenditures for improvements, and thereafter maintain what would in effect have been a boarding scheme. The Trustees gave to the subject careful consideration, but nothing was done thereunder.

The Mount Grace Reservation has been surveyed and a plat thereof put upon record.

The Trustees have given careful consideration during the year to plans for the saving of the forests of the White Mountains, or for reclaiming them after devastation so as to prevent the subsequent denudation by the elements.

The holdings of the Club have been increased during the year by gift from Mary W. Eastman, wife of Edson C. Eastman of Concord, New Hampshire, of two and a third acres of land upon Three Mile Island in Lake Winnepesaukee. It is the expectation of the Trustees to build upon this lot during the spring a simple and rustic cabin, which may be the beginning of its general use for camping purposes. It has been the pleasant duty of the Trustees to announce each year an accession

to our holdings, and we are indebted to the generous kindness of our fellow members, Mr. and Mrs. Eastman, for the privilege to do so this year.

We annex hereto a statement of our receipts and payments since our organization, from which it appears that very little money now remains in our hands, and if we are to continue our work it is necessary that we shall be in receipt of further sums. If any one would like to contribute toward the building of the proposed cabin upon Three Mile Island, he is at liberty to designate his contribution as being for this purpose, and it will be so used.

Respectfully submitted,

HARVEY N. SHEPARD,	} Trustees of Real Estate.
CHARLES L. NOYES,	
CHARLES E. FAY,	
J. RAYNER EDMANDS,	
AUGUSTUS E. SCOTT,	

RECEIVED BY TRUSTEES OF REAL ESTATE.

1895.	Feb. 26.	Martha T. Folsom . . .	1
Feb. 11. Grenville H. Norcross, \$25	" "	Catherine E. Folsom . . .	1
" 12. Henry P. Curtis . . . 5	" "	Charles E. Jameson . . .	1
" " Louis Robson . . . 10	" "	Charlotte J. Wills . . .	1
" 14. Mrs. J. W. James . . . 10	" "	Emma M. Wills . . .	1
" " E. E. Norton . . . 5	" "	Marion S. Eustis . . .	1
" 18. Herschel C. Parker . . . 5	" "	Roland N. Cutter . . .	2
" 19. George Sampson . . . 10	" "	Louis F. Cutter . . .	5
" " Mrs. George Sampson 10	Mar. 7.	Delia D. Thorndike . \$20	
" 20. E. C. Eastman . . . 10	" 8.	John E. Alden . . .	5
" 21. Albert Matthews . . . 25	" "	John F. Alden . . .	2
" 23. Rosewell B. Lawrence 20	" 9.	William H. Cades . . .	30
" " Marion C. Jackson . . 50	" "	Norman Williams . . .	10
" " Sarah O. Jewett . . . 10	" 14.	Gardner M. Jones . . .	10
" " Parker B. Field . . . 2	" "	Anne Whitney . . .	50
" " Frances A. Smith . . . 2	" "	A. A. Manning . . .	10
" " Zilpha D. Smith . . . 3	" 22.	Harriet A. Purington . .	1
" " Emile F. Williams . . . 25	" 25.	C. A. L. Richards . . .	5
" 25. Albion A. Perry . . . 5	" 26.	George W. Williams . . .	5
" " Ira C. Porter . . . 5	" 29.	Lucy A. Putnam . . .	3
" " Rachel S. Porter . . . 5	Apr. 1.	William E. Stowe . . .	5
" 26. Catherine A. Folsom . . 1	" "	F. G. Webster . . .	5
" " Anna A. Folsom . . . 1	" 16.	Elizabeth L. Marsh . . .	1

May 6. James Schouler . . .	25	1897.	
Nov. 5. Joseph S. Fay . . .	50	May 14. James Schouler . . .	25
1896.		Aug. 18. A. M. C. by John E.	
Jan. 14. Mary E. Lodge . . .	10	Alden, treas.	200
" " Jeannette Eastman . . .	5	1898.	
" 27. Mary E. Atkins . . .	25	June 29. James Schouler . . .	25
May 13. James Schouler . . .	25		
June 15. M. A. Tufts	6	Total	\$815

PAYMENTS.

1895.	
May 21. Alfred R. Evans, purchase of Randolph Reservation . .	\$400.00
1896.	
Jan. 24. W. & P. P. Co., 500 cloth signs	9.50
Oct. 7. Randolph tax	4.20
1897.	
Feb. 10. Shelburne record fees and postage	1.50
Aug. 18. Augustus E. Philbrook, clearing Shelburne Reservation .	213.41
Sept. 2. Randolph tax	4.00
Dec. 14. L. M. Watson, clearing borders Randolph Reservation .	25.00
" 24. Record of Parsons deed	1.13
1898.	
Jan. 20. Topographical sheets	2.00
June 25. Shelburne tax	6.80
Aug. 17. Augustus E. Philbrook, planting Shelburne Reservation	6.25
Nov. 9. Randolph tax	6.00
Dec. 13. Record of Fay deed . . . . .	.90
1899.	
July 12. Randolph tax	3.80
Nov. 1. Clapp & Abercrombie, survey and plat of Mt. Grace	
Reservation	86.80
" 7. Shelburne tax	7.00
	<hr/>
	\$778.29
Remainder on hand	\$36.71

Reports of the Councillors for the Autumn of 1899.

Art.

BY HELEN E. ENDICOTT.

DURING the past year the collection of photographs belonging to the Club has been increased by the addition of four sets of mountain views from the western part of the continent and several from nearer regions. The attention of the Councillor was called to the beautiful photographs taken in the Selkirks

by the Messrs. George and William S. Vaux, Jr., of Philadelphia, which had been exhibited at the Boston Camera Club. Mr. George Vaux, Jr., to whom application was made for a set of these views, kindly made a selection from their negatives, and prints from these were made for us by Miss Vaux at an expense to the Club of the mere cost of materials. We have already received thirty $6\frac{1}{2} \times 8\frac{1}{2}$ prints and a panorama of nine 4×5 's, with a promise of more, which will be sent later. The larger prints have been suitably bound; and the panorama, a most beautiful one of the view from Mt. Avalanche, has been mounted and framed for the Club rooms. These photographs will serve to illustrate many recent articles in APPALACHIA.

For the same purpose a collection has been made of photographs taken both in the Selkirks and in the Rockies by members of the Club who since 1895 have visited these mountains. We have had printed eighty-five views, taken by Mr. Charles S. Thompson, and twenty-eight taken by Professor Charles E. Fay, from negatives loaned by them. The latter also gave several prints made by himself. Mr. George M. Weed presented some thirty prints from his own negatives, and a few more from negatives by Mr. Thompson and Rev. Charles L. Noyes. Mr. Herschel C. Parker also presented twenty-eight prints taken by himself. All these have been so arranged in a Gilson adjustable album that it will be possible to insert, in their proper places and to a considerable number, photographs illustrating the Club work in these mountains for several years to come.

Two other sets of views represent the West. Mr. Alvin R. Bailey has given to the Club the Santa Fé Railroad Company's book of color photographs of New Mexico, Arizona, and Southern California; and we have bought thirty Sierra photographs from negatives of Professor J. N. Le Conte, which have been bound with those presented by him last year.

For several years Mr. William H. Cades has given to the Club blue prints of views in the country round about Boston. From the large number of these on hand, sixty have been selected and bound, making a very interesting volume.

The Adirondack region is represented by photographs given by Mr. Charles H. Sanders, Professor Edwin A. Start, Mr. Joseph E. Holmes, and Mr. H. C. Parker. Another recent gift

is a Gilson adjustable album presented by Miss Susanna Sanderson.

Several exhibitions have been held during the year. In January Mr. H. G. Peabody's Vermont photographs were shown at the Room Committee's reception, and with these a panoramic view of the Mt. Washington range, — a gift from Mr. Peabody to the Club. In February a large number of photographs loaned by members and friends was exhibited at the Annual Reception. Among these was a set of photochromes loaned by Mr. Charles Pollock. Mr. Harlan P. Kelsey's photographs of North Carolina scenery and flowers, also loaned for this occasion, were exhibited afterwards at the Club room for several weeks.

In May, at the reception held by President and Mrs. Herbert, the Sierra views given by Professor J. N. Le Conte, and several enlargements loaned by the Sprague and Hathaway Co., were exhibited. The latter included views of Lake Minnewanka and Tryon Peak, North Carolina; the Presidential Range from Intervale; and the Profile. The Profile enlargement was given to the Club.

The exhibitions of photographs arranged for the reunions of the Snow-shoe and Camping trips were also left, wholly or in part, at the Club rooms for several days.

Mounting and binding photographs already on hand has completed the work of the Department.

REPORT OF THE COMMITTEE ON THE SELLA COLLECTION.

SINCE the rendering of the Committee's last annual report the Sella Collection has remained in the custody of the Library Art Club. In accordance with the agreement made when it was transferred, for the time being, to their charge, the officers of that association have kept the Committee apprised as to the whereabouts of the several sets of pictures into which the Collection has for greater convenience been distributed, and a member of the Committee has on several occasions visited one and another of the exhibits given under the auspices of local public libraries. No reason has been discovered for regretting the arrangement into which we have entered.

The Secretary of the Library Art Club (Miss W. B. Smith, of the

Cambridge Public Library), under date of January 8, 1900, reports the following interesting facts : —

Since May 22, 1899, to date there have been held thirty-nine exhibitions at different libraries, the Collection being divided . . . into three parts. Since September 1 the exhibits have been three weeks in length, instead of two, as was the period at first.

When the No. 2 Collection was at the Brockton Public Library, one of the teachers in the High School there made a few notes on the pictures for the benefit of the graduating class. These notes were printed in a local paper, so that the general public were enabled to appreciate the pictures more fully. The object of these notes was to make the pictures more intelligible as illustrations of the earth's structure, rather than showing any artistic or scenic splendor.

The membership of the Club has increased to 75 members within the past six months, among the new members being 3 from Maine, 3 from Vermont, and 3 from Connecticut, besides a considerable number from Massachusetts. The pictures have not yet gone to all of the older members and to only two or three of the new ones.

The collections . . . have been greatly appreciated by those members of the Library Art Club that have exhibited them during the past year.

This rapid increase of the number of libraries which will exhibit the Collection is on the one hand a subject of congratulation, in so far as it is our desire to have the pictures seen and appreciated ; on the other, it excites apprehension as to the natural result of wear and tear in passing through so many hands in the process of transferring, hanging, and repacking. Ceaseless care will need to be taken, and it is not impossible that our Committee will feel constrained to ask instructions of the Club to determine the question of policy : whether it is better to sacrifice the beautiful Collection utterly, if need be, in having it a source of pleasure and instruction to thousands, or to preserve it as a Club asset and possession for the occasional enjoyment of comparatively few.

CHARLES E. FAY,	}	<i>Committee on the Sella Collection.</i>
HELEN E. ENDICOTT,		
WILLIAM H. LAWRENCE,		
WILLIAM O. WITHERELL,		

Reports of the Councillors for the Autumn of 1899.**Exploration.**

BY CHARLES L. NOYES.

THE only reports of explorations which have reached the councillor are of ascents in the Canadian Alps, as follows:—

I. The Selkirks.

1. The first ascent of Mt. Dawson was made on August 13 by Messrs. Charles E. Fay and Herschel C. Parker, accompanied by the two Swiss guides, Christian Häsler and Edouard Feuz. The entire trip was made in a day and a half from Glacier House,—a forced march, as two nights should properly be taken for this otherwise arduous ascent. A bivouac was made in the timber on the lower slopes of Mt. Fox, just above the moraine of the Dawson Glacier. Leaving here at 4 A. M., the summit was reached at 10.45. The route was over the névé in the amphitheatre between Fox and Dawson, up the steep head-wall of the same, thence along the arête joining these two mountains, and over the lofty snows to the rocks of the eastern slope of the summit ridge, and then to the top of the sharper of the two peaks of Dawson, which proved to be a few feet higher than the one lying perhaps a half mile farther west. It is proposed to discriminate between these two summits by designating the one ascended as “Häsler Peak,” the other as “Feuz Peak.” An hour was spent on the top, during which a cairn was built and a record deposited. The approximate height by aneroid was found to be 10,800 feet. Clouds prevented satisfactory observations with the level, but Mt. Bonney was observed to be distinctly lower. Returning by the same route, the camping spot was reached at 3 P. M., and the return to Glacier begun immediately. The steep climb to the Asulkan pass was accomplished in a pouring rain, the pass itself made (6.30) in a dense fog; thence a rapid pace taken down the valley of the Asulkan stream, Glacier being reached at 8.45 in the evening. A detailed account of the ascent will appear in APPALACHIA, Vol. IX., No. 3.

2. An ascent of Eagle Peak by a new route (over the south-east arête) was made on August 5 by Professor C. E. Fay, accompanied by Häsler. This was the supplement to a trip

undertaken in 1894 by Messrs. Fay and R. F. Curtis, related in APPALACHIA, Vol. VII., No. 2. The party left the hotel at 9.15 A. M., reached the summit at 2.30 P. M., started down at 3.40, and arrived in at 5.25, or in one hour and forty-five minutes. This day's work proved that it would have been practically impossible for that earlier party to have reached the summit, owing to a somewhat difficult buttress that obstructs the way. The descent was made by the usual route. A thunderstorm experienced just below the summit created a momentary excitement, as the lightning struck just over the rocky shelter in which the party had sought refuge, dispensing fragments of stone on Häsler's boots.

3. An ascent of Eagle Peak had already been made the same season, on July 19, by Mr. Henry G. Bryant, of Philadelphia, a corresponding member of our Club, and Mr. L. J. Steele, of London, England, accompanied by Häsler and Feuz. The usual way was taken in ascending: up the Cascade trail to the flat, thence over into the high valley lying next east, and by it to the snow slopes of the south face. The party descended over the steep northern side, this being the first attempt to make it. This descent is said "to present some of the worst features of rock climbing, and should not be attempted except by experienced climbers under skilful guidance. The rock proved to be weathered and most treacherous in the holds it afforded."

It is of interest to note that the second ascent of Mt. Sir Donald was also made feasible this year by the presence at Glacier House of these two excellent guides. It was accomplished by a German and a French climber, accompanied by them, on July 26,—nine years to a day since the first conquest of the peak by Messrs. Huber and Sulzer of the Swiss Alpine Club. This ascent was made over Green's Peak,—a long and by no means easy route,—and required a much longer time than would have been necessary had the route of their descent been taken both ways, namely: straight from the col between Green's Peak and the mass of Sir Donald, and down upon the small glacier heading between them.

Messrs. G. and W. S. Vaux, Jr., of Philadelphia, completed a series of very interesting measurements of the movement of the Illicilliwaet Glacier, of which a report appears in APPALACHIA.

II. The Canadian Rockies.

Subsequent to his visit to the Selkirks, Mr. H. G. Bryant joined Mr. Walter D. Wilcox and Mr. Steele in an eleven days' camping trip, during which the region south of Banff was visited. On this expedition a new pass over the continental divide was utilized; and the party was enabled to reach Mt. Assiniboine — the objective point of the trip — in three and a half days of actual travel from Banff. A snowstorm on July 27, while the party was travelling along the main watershed of the region, was a disagreeable incident of the journey.

While encamped near Mt. Assiniboine, the travellers reconnoitred the peak, which they pronounced extremely difficult from the northwest approach. While recognizing the futility of attacking the main peak, however, Messrs. Bryant and Steele, in the unavoidable absence of Mr. Wilcox, essayed to climb the lower slopes of the mountain with the object of making a closer examination of its characteristics. After five hours of "stiff" work, involving considerable step-cutting in the steep snow slope, they reached the northwest ridge of Mt. Assiniboine at a height ascertained by aneroid to be 10,000 feet. A fine view of the rugged country to the south, which probably embraces the largest unexplored area in British Columbia, was obtained, and a fine series of photographs secured. From several points of view this Canadian peak has a marked resemblance to the Matterhorn.

The Photographical Society of Philadelphia spent several days in camp near Emerald Lake, during which the col crossed by Habel in 1897 (see APPALACHIA, Vol. VIII., No. 4) was visited, and some good pictures of the great waterfall were secured.

Report of the Councillors for the Autumn of 1899.**Improvements.**

BY PARKER B. FIELD.

OWING to the neglect of many paths last year, due to the lack of a sufficient appropriation, a heavier burden than usual has been placed upon the Club this year, and, though much has been accomplished, there is still ample opportunity for more work on existing paths.

A large share of the work has been done about Randolph, where there are many Club paths. The Air Line, which has been slighted of late, was thoroughly cleared by L. M. Watson, as was its branch toward King's Ravine. Lowe's path, to Mt. Adams, was cleared by T. S. Lowe, and a blind place at the edge of the timber was marked. Much work was necessary on Lowe's Ravine path on account of a heavy windfall. This path was well cleared by T. S. Lowe, and marked all the way to its head at the gateway above King's Ravine. The route under the boulders of King's Ravine was clearly remarked with paint. The path from the log cabin on Lowe's path down to the Ravine of Cascades was also cleared by Mr. Lowe to the point where it joins a new and more direct path to Cascade Camp, and the last few hundred feet have been abandoned. The Castles path from the forks of Israel's River, over the side of Mt. Bowman, has been thoroughly cleared and re-blazed to the Lower Castle by Hubbard Hunt.

The Madison Spring Hut has received from L. M. Watson a new coat of paint on its outside woodwork, and the walls have been re-pointed with Portland cement.

Across the valley the Ice Gulch path has been cleared by L. M. Watson.

The work of re-opening the path from the valley of the Peabody River up Nineteen Mile Brook to Carter Notch, which was begun by T. S. Lowe last year, was completed by him this season. But little work was found necessary by J. G. Davis on the Jackson path to Carter Notch and Dome, and the camp in Carter Notch seemed in excellent condition.

The old camp near Hermit Lake, below Tuckerman's Ravine,

was found to be untenable and past repair; and as most of the timber about it has been cut off, making the location unsightly, a sign "Abandoned" was placed over the door, and a new location for a camp was found just below Hermit Lake, perhaps two hundred feet from it. Here has been built a substantial open shelter camp for seven persons, to be known as "Hermit Lake Camp." The water supply is some thirty feet distant, a small cold stream which issues from what is thought to be a never-failing source under the rocks of the Lion's Head. The camp was built by T. S. and V. D. Lowe, of Randolph, assisted by the Councillor and friends. The path from the Raymond path via Crystal Cascade to the Glen road was cleared and drained.

The path from Diana's Baths to the northern summit of Moat Mountain was found to be densely overgrown, and George G. Lucy, of North Conway, was employed to clear it.

The Mt. Carrigain path was bushed out by James Chase, of Bartlett.

The two Club paths in Waterville, that toward Livermore and the one to Black Mountain (Sandwich Dome), were cleared for the Club by the Waterville Athletic Association.

Passaconaway Lodge was in a state of dilapidation this spring, and as the location had been rendered less desirable by the cutting of timber and by windfalls, it was decided to re-build on a new spot. An open shelter camp, 9 by 13 feet, has therefore been built on a location farther west, where there is an excellent water supply. Advantage was taken of this opportunity to re-locate the whole upper portion of the Passaconaway trail, which now ascends the western side of the wooded cone, passing near the new camp and shortening the ascent by about ten minutes. The new camp will take the name of the first one. The work was well done by F. J. Bickford, of Tamworth, and many thanks are due to Professor C. E. Fay, who planned and supervised the undertaking.

In preparation for the Field Meeting at North Woodstock, the Councillor and the Chairman of the Field Meeting Committee, Professor E. A. Start, approached the source of the East Branch of the Pemigewassett River from Livermore by way of the Carrigain Notch, and followed the stream out to

North Woodstock. The bed of the river was followed to the junction of the North and South forks, and from here a path was found following the left bank. The trip was taken to decide upon the expediency of cutting a path up the river to Mt. Carrigain, but the plan did not seem feasible for the present.

The paths to Mt. Moosilauke, Mt. Cilley, and Loon Mountain, though not Club routes, were cleared in preparation for the field-meeting, and ladders were made for use in the Lost River.

The most serious problem which has confronted the Councillor has been that of preventing the uncomfortable and almost indecent overcrowding of the Madison Spring Hut. Feeling sure that this was due to thoughtlessness and not wilfulness, a set of rules was printed and sent to the leading hotels where climbers resort, with the request that they be conspicuously posted. It would seem that, were these rules followed, there would be little more overcrowding; but the season has passed with but slight improvement in the conditions. At the request of the Councillor, a committee has been appointed by the President to confer in relation to this matter, and it is hoped that they may make valuable suggestions which will, if carried out, remedy the difficulty.

Much activity in road- and path-making has been shown this year by persons outside the Club, as well as Club members in their private capacity, the following having been brought to the attention of this Department:—

Mr. Anderson, proprietor of the Mt. Pleasant House, reports that, in conjunction with Mr. J. R. Carter, a summer resident of Jefferson, he is now constructing a carriage road which will be a connecting link between the valley of the Ammonoosuc River, near Base Station, and the town of Jefferson. It will pass through what he styles the "Jefferson Notch," between Mt. Jefferson and Mitten Mountain, and is likely to prove a most attractive as well as convenient route. He also contemplates building a road from the Crawford House around Mt. Clinton to Twin Rivers.

Messrs. Barron, Merrill & Barron, proprietors of the Crawford House, have made a beginning upon Mt. Clinton, whereby

the old "Bridle Path" is to become a comfortable footway from that hotel to Mt. Washington. Mr. J. Rayner Edmands has kindly consented to engineer this work.

The conspicuous features of Mr. Edmands's own work this year are the Randolph Path and the Short Line. The former is open throughout its length from Wood's Farm, near Randolph Station, to the Gulfside Trail in the col between Mts. Adams and Jefferson. Its thorough grading now extends nearly to the level of The Perch. The houses at Randolph Hill thus have direct and easy access to the northern range.

The Short Line starts at Beechwood Brook upon the Air Line, and joins the Randolph Path before Cold Brook is reached. These paths together make an important saving of distance between the Ravine House and Mts. Washington and Jefferson, and distribute the rise more evenly. An extension of the Short Line towards King's Ravine has been begun.

Mr. E. B. Cook has done much in the Randolph region. He has had a path cut from the Mt. Crescent House directly to the head of the Ice Gulch. This will save over a mile, and a return to Randolph can be made by the Club path from the foot of the Gulch. Mr. Cook has also made a short path, which he calls the "Intermezzo Rusticano," which leaves the Air Line at a point just below timber limit and runs in a southerly direction into the Valley-way, thus affording travellers on the Air Line who wish to avoid the windy "knife-edge" walk a sheltered way to the Hut. This route from the Ravine House he finds to be a couple of hundred feet shorter than by the Madison Path and Valley-way; the latter, on the other hand, are graded paths with a more uniform ascent.

It is most gratifying to be able to report upon the work of the Wonalancet Out-Door Club, an organization of residents and summer visitors, with headquarters at Tamworth, in the district formerly known as Birch Intervale, but now called Wonalancet. The interests of this club, similar to those of the Waterville Athletic Association, are in parallel lines with the work of this Department. At the close of its second season, its President, Mr. Albert H. Hall, of Cambridge, reports the following work accomplished:—

Last year the old spar-road was cleared to the height of land,

and the path was extended to Square Ledge. A carriage-way was built on Mt. Catherine, stopping at a spring, and the way onward to High Ledge was marked. A new path was also cut to the Big Rock Cave, on the farther side of the ridge known as "Mt. Mexico."

This year a new path was cut to Wonalancet Falls, and a trail was blazed to the summit of Mt. Wonalancet. The greatest improvement, however, was the opening as a regular path of the snow-shoe trail to the summit of Mt. Whiteface, mentioned in the report of last year as blazed by Mr. G. H. Taylor, and the erection near the summit of a permanent log camp for six or eight persons, which contains a stove, and is provided with large double doors, which may be thrown open in summer.

Acting in harmony with this club, Dr. William H. Rollins has had a path opened from the summit of Mt. Whiteface along the ridge to the Club path on Passaconaway, and from there down the east slope of that mountain to Square Ledge. This path is most valuable as a connecting link, and makes several circuit trips possible.

There are still some Club paths which should be cleared as soon as circumstances will permit. The path on the Twin Range has been neglected for years on account of lumbering operations in the vicinity. This should be cleared as far as Mt. Bond, and from there a rough trail at least should be blazed down to the Pemigewassett River at the forks, where one may go out via Thoreau Falls and Willey Pond to the Crawford Notch, via the Carrigain Notch to Livermore, or down the river to North Woodstock. A camp at this point would be of great value.

The Mt. Willey path needs attention. As soon as the logging ceases, the Carter-Moriah path should be cleared and the Imp Camp repaired. A system of cairns should be placed on the Castellated Ridge from the Castles to the summit of Mt. Jefferson.

The trail of the Cascade Brook in Randolph should be cut out soon, though it should be kept as a rough trail rather than a path. The path to the Pond of Safety was purposely neglected this year, as it is hoped that next season a more direct and drier route may be laid out.

After a somewhat hasty survey, it appears to the Councillor

that it would be a simple matter to open a path starting from a point on the Tuckerman Ravine path, ascending by comparatively easy grades the long easterly ridge of Boott's Spur, and continuing over the spur via the ancient Davis path to the Crawford Bridle path at the base of the cone of Mt. Washington, near the Harry Hunter monument. This path would command the best possible view of Tuckerman's Ravine, would pass within a few feet of the Gulf of Slides on one hand and the Overhang Crag on the other, and would make a most desirable circuit for persons who wished to ascend from the Glen over the spur and return through the ravine.

During the season several mountain record rolls have been substituted for those which have been filled, and two new cylinders have replaced others which were lost. New cylinders should now be placed on Mts. Lafayette, Webster, Jackson, and other peaks.

The supply of cylinders having become exhausted, new ones have been made with the small caps permanently attached, as the covers formerly used were easily lost.

All Club paths and camps, excepting those last mentioned, are now in such condition that in all probability only slight repairs on them will be necessary next year. With a liberal appropriation, the new work outlined can be done, and it is hoped that the labor of one more year will make every path and camp a credit to the Club.

Report of the Room Committee for 1899.

OUR rooms in the Tremont Building have in no wise lost their popularity and attractiveness to our members. This fact is shown by the registry of names on almost every day of the year, Sundays not excepted. The rooms have been regularly open on week day afternoons, those of July and August excepted, under the care of volunteer custodians, to whom the thanks of the Committee and the Club are due. More than five thousand names on the register attest this popularity, and the register is at best but an imperfect record.

The "at homes," which were a feature of the last year's social life of the Club, have been continued, although since the summer vacation they have given way to the unusually numerous reunions of the excursion parties. On January 25 the Room Committee entertained in the rooms, and on May 9

President and Mrs. Herbert received. The latter occasion was made more delightful by the presence of an orchestra, while the usual collection of photographs was on view. The attendance on each of these occasions was above four hundred.

The use of the rooms for meetings of the Council and committees has increased, sometimes several committees being in session at the same time. The sections of the Club have also held their meetings here. Other societies, among them the Massachusetts Forestry Association and the Teachers' Geography Club, associations with kindred interests, have been afforded the opportunity to hold their meetings in our rooms.

The furnishings of the rooms have been improved through the gift, by the late Mrs. Thorndike, of a beautiful portière for the reception room; an unexpended balance from a reception to Mr. Newcomb has been converted into minor articles of use or adornment which have been given to the room, while the safety of those using the popular window-seat has been assured by the installation of iron window guards of a neat, decorative pattern.

J. RITCHIE, JR.,	} <i>Committee on the Club Rooms.</i>
ISABEL BATCHELDER,	
HELEN E. ENDICOTT,	
SUSAN H. B. FULLER,	
ELLEN W. RUMRILL,	

Report of the Excursion Committee for 1899.

DURING the past year the Excursion Committee has been able to turn aside from the familiar, well-beaten tracks, and to offer to the members of the Club some trips into new districts, three of the longer excursions having been taken to places to which no Club party had previously gone. An additional novelty was the carrying to success a carriage-drive lasting through ten days. The Outings also had in them some novel features which will be mentioned in the portion of this report devoted to the afternoon and single day trips.

In all seven Excursions were planned and carried out, and forty-six Outings.

The Winter Excursion as usual was arranged and managed by the officers of the Snow-shoe section, Messrs. Davis and Lawrence. The party left Boston on Saturday, February 18, for the Iron Mountain House in JACKSON, N. H., and returned February 27. During the ten days many trips were taken, large parties making the ascent of Thorn Mountain and Mount Willard, and smaller ones going to Giant Stairs, Iron Mountain, North Double Head, and Carter Notch and Dome. Some thirty climbed into Tuckerman's Ravine as far as Hermit Lake, and seven on the same day reached the top of the head wall, walking up a steep incline of snow which reached far out into the ravine. Later in the week two different parties

of three and two respectively made the ascent of Mount Washington. The driving parties rode to Bartlett, the Prospect Farm, and to Dundee. The party numbered seventy-nine, the largest of an ever increasing series, contrasting strongly with the first snow-shoe parties to Jackson, which numbered eight and eleven respectively.

The excursion for the vacation at Decoration Day was to STINSON LAKE, Rumney, N. H. The beauties of the place were known to the President of the Club, who was born in Rumney, and to the Chairman of the Excursion Committee, who had camped on the shore of the lake some seventeen years ago, and these two gentlemen formed the committee. The owners of summer cottages at the lake tendered to Mr. Herbert the use of their respective houses for the Appalachian party, an essential factor of the trip, since the nearest hotel is some six miles distant. A dining-room was improvised in a boat-house and an exceedingly enjoyable "cottage-camp" became possible. The party left Boston on Friday, May 26, and returned on May 31. During the stay the ascent of Mount Carr was made by ten, that of Stinson by three, and the low crest of Rattlesnake by more than twenty. The lake lies to the north of Plymouth between Mts. Carr and Stinson, so that the summits of the surrounding hills and even the high points along the carriage roads give extended views of the White and Green Mountains and the nearer Ossipee and Sandwich ranges. One of the drives was over into the Woodstock valley, dining at Blair's, with a return past the talus of Hawk's Ledge, where snow was still found in the ice cave. The party numbered forty-five.

The thirty-fourth Field Meeting was held at the Deer Park Hotel, NORTH WOODSTOCK, N. H., July 1-10. Seventy-five members and guests were present. The party left Boston on the morning of Saturday, July 1, dining at the Pemigewasset House in Plymouth, and arriving in North Woodstock in the afternoon. Fourteen rode up the valley from Campton Village to the Deer Park.

Late in the afternoon of Saturday, Mr. Harvey N. Shepard, Chairman of the Trustees of Real Estate, led a short walk through the beautiful tracts of woodland recently given to the Club by Miss Sarah B. Fay. Sunday morning religious services were held in the parlor by the Rev. J. Edgar Johnson, and in the afternoon a large number accepted Mr. Johnson's cordial invitation to visit his camp-colony at "Mountainside," two and one half miles from the village, noting the Agassiz Basins on the way.

Monday, under Mr. Start's leadership a party of about forty ascended Loon Pond Mountain, lunching on the lower summit to which the path leads. In the afternoon the tramping party, and those of the party who had spent the day more quietly, enjoyed the cordial hospitality of Mr. and Mrs. Frank O. Carpenter, at their pleasant cottage "Ferncliff."

Tuesday was assigned to the ascent of MOOSILAUKE, which on its eastern side was new to nearly all. The walking party went by the way of the new path which ascends the Blue Ridge along the line of Beaver Falls, a series of twelve beautiful cascades descending the precipitous mountain side in long slides and plunges. Twenty-four were in this company under the care of Mr. Start, with R. C. Jackman for guide. Seventeen others, in

charge of Mr. J. A. Crosby, rode to Breezy Point, and ascended from there on foot or in carriages. The accommodations of the Tip-Top House were fully tested by the party, which remained all night on the summit. Wednesday morning a fine sunrise was enjoyed, and after breakfast the two sections took their respective ways for the return. The walking section, which reversed the route of the preceding day, stopped for lunch at the head of the Lost River. Here they were joined by others who had come up from North Woodstock under the care of Mr. Carpenter with the guide, Franklin L. Clark. The augmented party, thirty-one in number, spent a couple of hours in the trip through the gorge of the Lost River, which is one of the most interesting features of the region.

On Thursday afternoon the company was entertained by Professor Clara E. Cummings, of Wellesley College, at her summer home in the village. In the evening a meeting was held in the hotel parlor, with President Herbert in the chair. Mr. Start gave an informal account of a journey of exploration through Carrigain Notch from Bartlett to North Woodstock, made by Mr. Parker B. Field and himself, with a guide, early in the same season. A few photographs taken on this trip were shown. Mr. R. B. Lawrence supplemented this by an account of an earlier trip by Club members from the Twin Mountain House over the Twin range into the East Branch country.

For Friday the proposed trips were the **PROFILE HOUSE** and the **LAFAYETTE RANGE**. In spite of threatening weather and showers about forty took the drive to the Profile House. The Lafayette party waited till nearly noon for an improvement in the weather, and then started on the regular path to Lafayette. The summit was reached in fog, but the proposed ridge walk was not deemed advisable. This party numbered fourteen.

On Saturday morning fifty-four persons were taken up the East and Hancock branches on the lumber railroad of J. E. Henry & Sons. The road, sixteen miles in length, penetrates to the heart of the wilderness under Osceola, showing a country new to almost every one. The return to the hotel was through a heavy shower. In the evening a second meeting was held in the parlor of the hotel. President Herbert expressed the regret felt by every one that Professor Niles was unable to be present to give the promised talk on the geology of the district. He then introduced Professor Cummings, who spoke on the subject, "How the Appalachian Mountain Club can assist in the study of mountain flora, with especial reference to the botany of the North Woodstock region." This address was very interesting, and was exceedingly practical in its suggestions for more systematic work in the study of mountain flora. An address was also made by the Swami Abhedānanda on the Hindu Philosophy. On Monday morning the party returned to Boston. Though not so large in number as some of the recent field-meetings this one was exceedingly successful so far as results are concerned. Beaver Falls, Lost River, the valley of the East Branch, and the Moosilauke path were new and enjoyable features. The Deer Park Hotel provided for the comfort of the party in every possible way. The Committee having charge of the Field Meeting consisted of Messrs. Edwin A. Start, and John Ritchie, Jr., and Mrs. John Herbert.

The Club camping party of 1899 was the largest that has been under canvas in the history of the Club. The roll-call reached a total of sixty-two, of whom fifty-three slept in tents, and nine had quarters in the log camps at The Birches. The camp ground was the wooded southern point of Student Island in LAKE MOOSELUCCMAGUNTIC, Maine. At the extreme point were situated the temporary wharf and the cook-house, both of which were furnished by Captain F. C. Barker, proprietor of Bemis and the Birches, who looked after the table. Near the cook-house was the dining-marquee, under which seventy-five could have found comfortable places at table. The sleeping-tents, twenty-eight in number, were arranged in irregular lines wherever suitable sites could be found. A small steamer, the Oozalluc, was chartered for the two weeks of the camp, while a fleet of rowboats and several canoes were at hand for individual water trips. There was also at the point a fine beach, which was well patronized by the bathers.

The main party left Boston Saturday morning, August 12, reaching the camp in time for supper, the tents having been pitched and prepared for occupancy by a small advance guard of half a dozen. Monday a scouting party made an exploration on the southern side of Aziscoos, while in the afternoon a large party made the ascent of BALD MOUNTAIN. On Tuesday a party was taken to Haines' Landing, crossing thence to the Mountain View House. Wednesday a party of twenty-one with three guides went to the summit of AZISCOOS, following the trail blazed by the scouts of Monday. A camp was made near the summit and the night was passed there, the return to Student Island being accomplished on Thursday. Thursday afternoon a steamboat party visited Cupsuptic lake and stream. Saturday about forty went to Bemis by steamer, and thence walked across the six-mile trail to Rangeley Lake, going in the afternoon to Rangeley village and later to Mountain View, and returning to camp in the evening.

On Monday, August 21, more than forty made the trip by steamer through the Richardson Lakes to South Arm, lunching at Middle Dam. Wednesday about thirty went to OBSERVATORY MOUNTAIN. From Upper Dam a trail was followed through the woods to Great Richardson Pond, which was crossed in boats, and the mountain ascended from its shore. The return was by the regular path to Molechunkamunk Lake and to Upper Dam by steamer. Thursday about thirty visited Lake Umbagog and the Magalloway, walking the picturesque Sunday Cove carry. On Saturday most of the party returned to Boston.

Camp fires, bathing, canoeing, rambling about Student's Island, and the care-free idling that only camp life knows filled in the time not occupied by the regular excursions. The weather was perfect, and there were no accidents or unpleasant incidents to mar the enjoyment of the company. The camp ground enjoyed perfect immunity from insect pests. The Committee in charge of the camp consisted of Messrs. George D. Newcomb and Edwin A. Start.

The opening this season of the Bay of Naples Inn afforded an opportunity for an excursion to NAPLES, Maine, which was conducted by Mr. Charles E. Lord. The party, which numbered fifty-five, left Boston on Saturday, September 2, at 9.00 A. M. for Sebago Lake, where the steamer Louise was

taken for Naples, about nineteen miles distant. The course of the Louise lay over the beautiful Sebago Lake and up the Songo. The experience of passing through the lock was omitted on account of an accident, and a change of steamers became necessary here. Emerging from the river into a small lake studded with islands, which has been named the Bay of Naples, a landing was made directly in front of the Inn, which is situated on high ground with a magnificent view of Long Lake and the Bay, with vast stretches of forest and pastures for a background. The next day a small party drove to the foot of Pleasant Mountain and attempted its ascent, but low-hanging clouds and a shower prevented the accomplishment of the plan. In the afternoon the steamer Undine took a party to Harrison, at the further end of Long Lake, a trip which all enjoyed thoroughly, notwithstanding a heavy sea was running which would not have done injustice to an ocean voyage. On Monday a successful ascent of Pleasant Mountain was made, and those who went were rewarded by a fine view. Others drove to Bridgton Heights, while in the afternoon the Undine carried a second party to Harrison. Tuesday morning was occupied by walks to neighboring heights and an inspection of the canning industries of the place, and in the afternoon the party left Naples with its beautiful surroundings and returned by steamer and rail to Boston.

The Fall Excursion was to BREAD LOAF INN in Ripton, Vt., another place to which very few of our Club members had ever been. The hotel is situated in the midst of the Green Mountain range, which has in the border of its plateau several peaks of four thousand feet altitude. The region is exceedingly interesting and one that has been but little developed, and while it may be deficient in the rock climbing afforded by the granite mountains of New Hampshire, is still full of pleasant climbs and rough scrambles.

The party numbered in all fifty-six persons, most of whom were at the Inn, from Saturday, September 30, till October 7. There were two "features" of this excursion: one the over-night camp on Mt. Lincoln, and the other the all-day walk from the hotel to Lake Dunmore. Mr. Joseph Battell, the owner of Bread Loaf Inn and of Mt. Lincoln, has built a commodious and comfortable cabin on the mountain at about 3800 feet altitude, and furnished it for twenty-five guests. The Club party numbered twenty-two, and driving over from the Inn on Monday morning, its members lunched at a farmhouse and in the afternoon walked up a fairly good road to the camp. The morning had been stormy, so that there was snow on the ground, and the atmosphere was such as to test the weatherly qualities of the hut. It proved to be thoroughly comfortable. In the morning nearly every one walked to the summit of Mt. LINCOLN, over some six inches of snow in the path. Mt. Lincoln rises to four thousand feet, and is exceeded in height by perhaps three other peaks of the range. The view is surpassingly fine.

The walk to Lake Dunmore was through delightful forests, by paths and wood roads, then across a great plateau and down to Silver Lake, and at length by a rapid descent past Llana Falls to Lake Dunmore. Other mem-

bers who did not wish to walk had driven over to the lake, and all returned together to the Inn.

The itinerary of the excursion was this: Sunday, minor walks to Pleiad Lake and Silent Cliff; Monday and Tuesday, Mt. Lincoln; Wednesday, drives to Granville; Thursday, Lake Dunmore; and Friday, Burnt Mountain, an all-day trip with luncheon. The drive to Codfish Corner in Granville was taken by several different parties, all of which speak of it as one of the most picturesque rides in New England. On Saturday the party broke up, some to return to Boston and others to begin the ten days' drive.

During the week one evening was devoted to a meeting, and Dr. Ezra Brainard, President of Middlebury College, spoke on the mountain forms of Vermont, their causes and some of the results. He explained how the material of the mountains, rich in plant-forming elements and easily eroded by the weather, produced rich upland fields; he showed how in Vermont there are no stony hillside pastures, but arable land reaching even to the mountain tops, and outlined some of the advantages, one of which is that there are no deserted farms. He turned next to the products of the soil and described some of the special trees and plants of the State. Following him came Mr. Battell, the proprietor of the hotel, who owns some 25,000 acres of forest land, which he has purchased to preserve. He presented briefly his ideas about forestry. He has fortunately come at a practical solution of some of the problems involved, and turns his woodland to some little profit, while at the same time rigidly preserving the forests.

The excursion was under the care of Mr. Ritchie.

On Saturday, October 7, a party of twenty-two set out in carriages from Bread Loaf Inn for a drive of ten days through the SOUTHERN GREEN MOUNTAINS, the objective point being Greenfield, Mass. The trip was in two ways a novelty: first since no party of the Club had ever been over the route, and again since no continuous trip in carriages had previously been attempted. All the natural features tended fortunately to the success of the trip: the weather was clear, with the exception of a single forenoon; though late in the season, it was not cold; the scenery, lakes, and mountain forms were picturesque in the extreme, and the glowing tints of autumn were at their height. As the party moved southward and to lower ground, it kept pace with the coloring of the leaves, and the last day was as pleasing in its autumnal brilliancy as was the first day.

The itinerary of the driving trip was as follows:—

Saturday morning from Bread Loaf Inn to Brandon, where dinner was served, and in the afternoon across the high hills of Sudbury to the chain of lakes of which Bomoseen is the principal one. The night was passed at "The Glenwood," near the lower end of the lake on its westerly side. Sunday most of the party enjoyed a morning sail on Bomoseen, and in the afternoon a delightful drive to Pawlet, passing St. Catherine's Lake and its guardian round-topped hills. The hotel at Pawlet, the Franklin House, contains but seven rooms, the village being of the old New England type, which still persists aloof from the railways; but the best houses in the town opened their doors to the party, and all its members were superbly lodged, while the table was the best of any throughout the trip. Monday morning

the route lay over into the Tinmouth Valley and back by the Mill Brook pass; but the view of the summit of Dorset Mountain was cut off by clouds. The party dined at Dorset Inn and moved on in the afternoon to Manchester, staying for the night at the Munson House. Tuesday morning the drive for the day was made to the "Walloomsac" at Bennington Centre, under the shadow of the battle monument. Wednesday was so warm as to be almost uncomfortable. The day's drive—the long steady rise up into Wilmington—was taken before dinner. In the afternoon six of the party made the ascent of HAYSTACK, while others rode to Highley Hill. Wednesday morning a special train conveyed the party down the narrow-gauge Hoosac Tunnel and Wilmington R. R. to the line of the Fitchburg R. R. The trip was continued to North Adams by rail. This ride through the gorge of the upper Deerfield River was a magnificent one, and is hardly to be surpassed east of the Mississippi. In the afternoon the party drove to Natural Bridge, remaining for the night at the Wilson House, North Adams. Thursday morning a special electric car conveyed the party to South Adams, where carriages were in waiting to continue the trip up over the Hoosac Range through Savoy. At noon a regular country dinner was served by farmer Taylor of Hawley, and in the afternoon the ride was continued to the Ashfield House, which was the headquarters of the party till Monday. On Saturday a drive was taken through the valley of the Swift River and that of the Westfield to West Cummington, with an *al fresco* luncheon at the Bryant homestead, and Sunday was devoted to minor informal walks about Ashfield, Peter's Hill and Dry Hill being objective points. On Monday the wagons were taken for the last time for a ride to Greenfield, stopping for a while at Deerfield to visit the museum and burying ground. While here Miss Baker welcomed the party to her home, the oldest house in the village, which was once the tavern, and which she has preserved and refitted in old-fashioned style. After a dinner at the Mansion House in Greenfield the party took an early afternoon train for Boston.

The distance covered during the ten days was about two hundred miles in carriages, in addition to which the extra rides were eighty miles and the railroad and electric car distances were thirty-four miles.

The party was in charge of Mr. Ritchie.

The Outings were under the management of a sub-committee consisting of Messrs. Ritchie, Newcomb, and Wilde. The novelties presented were, first, an outing to view the hills bordering the Merrimac River from the river itself, opening to the Club a district in the State unfamiliar to most of them: one along the bank of the same river in the electric cars, a trolley ride of sixty to seventy miles; next a two-day trolley trip from Worcester to Fitchburg, led by Mr. Parker B. Field; and finally a moonlight climb of Pegan Hill. Besides these there have been, at various times, other all-day outings, the number of which has been larger than in past years. Altogether there were fourteen of these all-day trips, seven of which were in the pleasant months of May and June. As a rule a second, shorter trip was provided for the same day, for the benefit of those who could spare only the afternoon.

The new regions visited were the middle hills of the Blue Hill range, now accessible for afternoon excursions, Tenney Hill at Methuen, Pow-wow, Powderhouse, Monday and Bailey's hills at Amesbury, and Sligo Hill in Marlboro. The most successful of the trips in point of number was the harbor excursion to Baker's Island on June 17, in which 272 members and their friends participated. The walk along the North Shore on April 19 numbered 180; the Decoration Day party, 50; the moonlight climb, 57, and three other outings numbered 50 or more each.

In all 53 outings were planned, but, as the weather interfered with 7, 46 were actually taken. The whole number of persons participating was 1670. Adding 315 for the excursions and 79 for the snow-shoe trip, the whole number of persons on Excursions and Outings was 2064.

A detailed list of the Outings follows :—

DATE.	OBJECTIVE POINT.	LEADER.	ATTENDANCE.
1899.			
Jan. 7	Hammond Pond,	Mr. Newcomb,	16
21	Bussey Hill and Arboretum,	Mr. Howe,	34
28	Castle Rock,	Mr. Burrill,	12
Feb. 4	Bear Hill (Weston),	Mr. Bailey,	12
11	Yellowstone Hill,	Mr. Chamberlain,	16
22 (all-day)	Bartholomew's Pond,	Mr. Newcomb,	12
25	Lynn Beach,	Mr. Newcomb,	14
Mar. 25	Ramhead Tower,	Mr. Lawrence,	27
Apr. 1	Breakheart Hill,	Mr. F. V. Fuller,	21
8	Arlington Moraine,	Mr. Ritchie,	28
15	Doublet Hill,	Mr. Norton,	49
19 (all-day)	Manchester and Magnolia,	Mr. Newcomb,	180
22	Dungeon Rock and Island Observatory,	Mr. Bailey,	50
29	Blue Hills (mari- golds),	Mr. Field,	32
May 6	West Roxbury,	Mrs. Witherell,	25
13 (all-day)	Blue Hill range,	Mr. Ritchie,	12
(afternoon)	Hancock Hill and Big Blue,	Mr. Newcomb,	37
20	Rattlesnake Hill,	Mr. Ritchie,	17
27 (all-day)	Ship Rock and Bar- tholomew's Pond,	Mr. F. V. Fuller,	4
(afternoon)	Bartholomew's Pond,	Mr. Newcomb,	30
30 (all-day)	Reservoir Pond and Hemlock Hill,	Misses Endicott,	50
June 3 (all-day)	Nahant,	Miss Saunderson,	10
(afternoon)	Nahant,	Mr. Newcomb,	36
10 (all-day)	Lawrence and Me- thuen,	Miss Emerson and Mr. Hale,	30
(afternoon)	Muddy Pond Woods,	Mr. Crosby,	20

EXCURSIONS.

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	17 (all-day)	Harbor excursion,	Messrs. Newcomb and Crosby,	272
	24 (all-day)	Merrimac River,	Mr. Ritchie,	66
	(afternoon)	Riverside Recreation Grounds,	Mr. Burrill,	34
Sept.	2	West Roxbury Parkway,	Mr. Howe,	5
	4 (all-day)	Proposed Boulevard from Lynn Woods to Middlesex Fells,	Mr. Crosby,	28
	9	Blue Hill (go-as-you-please),	Mr. Ritchie,	37
	16 (all-day)	Trolley trip, Wakefield to Newburyport,	Mr. Ritchie,	56
	(afternoon)	Prospect Hill (Waltham),	Mr. F. V. Fuller,	16
	23	Bear and Chickatawbut hill,	Mr. Field,	34
	30	Lantern Rock, etc.,	Mr. Bailey,	12
Oct.	7	Hubbard Watertower, Weston,	Mr. Chamberlain,	30
	21	West Roxbury Parkway,	Mr. Howe,	40
Nov.	4	Wampatuck and Rattlesnake hills,	Mr. Ritchie,	27
	7 (all-day)	Powderhouse and Pow-wow hills,	Mr. Ritchie,	35
	18 (moonlight)	Pegan Hill,	Mr. Newcomb,	57
	25	Castle Rock,	Mr. Burrill,	42
Dec.	2	Slide and Sassamon notches,	Mr. Field,	22
	9	Muddy Pond Woods,	Mr. Crosby,	26
	16	Franklin Park,	Mr. Howe,	20
	30	Prospect Hill, by northeastern cliffs,	Mr. Chamberlain,	15
				<hr/>
				Total, 1648

JOHN RITCHIE, JR.,	} Committee on Field Meetings and Excursions.
GEORGE D. NEWCOMB,	
CHARLES E. LORD,	
CHARLES L. BURRILL,	
ALBION D. WILDE,	
EDWIN A. START,	
RALPH C. LARRABEE,	

Proceedings of the Club.

April 11, 1899. — One Hundred and Ninety-first Corporate Meeting.

President Herbert in the chair.

Two hundred and sixty-five persons were present. The records of the last meeting were read and approved. Thirteen candidates for corporate membership were elected.

Rev. Roland D. Grant, D. D., gave an illustrated lecture entitled, "Wrinkles, Cracks, and Erosions." The subject was illustrated with views of scenery in many parts of the United States. The earth in cooling has contracted and wrinkled, elevations and depressions have taken place, and the elements have caused erosion and levelling. This process of change was shown by pictures of the moon, profile maps of North and South America and the United States, and about one hundred and fifty views of scenery, among which may be mentioned the Old Man of the Mountain, Niagara and Trenton Falls, Watkins Glen, Natural Bridge, the cañons of the Colorado, Green, and Rio Grande rivers, the Garden of the Gods, the mesas, caves, and petrified trees of Arizona, the Hoodoos at Banff, and Crater Lake in Oregon.

May 5, 1899. — Special Meeting.

Vice-President Abbot in the chair.

About two hundred and fifty persons were present.

The lecturer of the evening was Mr. Charles F. F. Campbell, a student of the Institute of Technology, and his subject was the work accomplished by the blind at the Royal Normal College and Academy of Music in London. Mr. Campbell is the son of Dr. F. J. Campbell, the founder and principal of the institution, himself a blind man, and by birth an American. In introducing the speaker Mr. Abbot alluded to his forty years' acquaintance with the father. A short sketch of the life of Dr. Campbell was given by the lecturer, some of the methods of instruction invented and the courses of study and physical training were described, and specimens of work in manual training were exhibited. Among the most interesting parts of the lecture was an account of a tour among the Alps by Dr. Campbell. A large number of lantern views were shown illustrating the college and grounds, the system of instruction, Mont Blanc and other Alpine peaks ascended.

May 10, 1899. — One Hundred and Ninety-second Corporate Meeting.

President Herbert in the chair.

About eighty persons were present. Eleven candidates for corporate membership were elected. Announcement was made of coming outings and the excursion to Stinson Lake, N. H.

Miss Elizabeth F. Fisher, of Wellesley College, gave an illustrated lecture entitled, "Russia and its People." Miss Fisher was a member of the international geological congress at St. Petersburg in 1897, and thus enjoyed an unusual opportunity to see the country and its people. The great

agricultural plains of Russia, the mines, the petroleum region, the Siberian convict system, were all described and illustrated. Most interesting, however, was the grand mountain scenery of the Caucasus.

June 14, 1899. — One Hundred and Ninety-third Corporate Meeting.

President Herbert in the chair.

One hundred persons were present. The records of the last meeting were read and approved. M. Joseph Vallot of Paris and Chamounix was elected an Honorary Member, and thirty-one candidates for corporate membership were elected.

Mr. William Lyman Underwood gave an illustrated talk entitled, "Hunting with the Camera." The speaker was evidently very fond of animals, and soon had the sympathy of his audience. About seventy beautiful stereopticon views were shown, representing deer, foxes, hedgehogs, dogs, cats, turtles, herons, partridges, owls, and other creatures. Great patience must have been exercised in taking these pictures, and a close study of animal life was evident. The eye and hand of the real artist were also apparent, and the spirit of the true sportsman. For the purpose of condemning the hounding of deer, the method was illustrated. The speaker told many interesting and humorous incidents in his work of taking pictures, and some of the results, particularly those of the owls, were exceedingly amusing.

July 1 to 10, 1899. — Thirty-fourth Field Meeting. Held at Deer Park Hotel, North Woodstock, N. H.

President Herbert in the chair.

Two meetings for the presentation of papers were held in the parlor of the hotel.

On Thursday evening, July 6, fifty-five persons were present. Professor Edwin A. Start addressed the Club, giving an account of a trip made in June by him and Mr. P. B. Field, the Councillor of Exploration, from Bartlett to North Woodstock, including the ascent of Mt. Carrigain. The travelling through Carrigain Notch was found difficult. The speaker advised building a camp at the Forks of the East Branch with paths to Carrigain, the Notch, and Mt. Bond. The Recording Secretary gave a short account of the Club camping trip in 1883 over the Twin Range to the Forks of the East Branch, and thence over Mt. Field.

On Saturday evening, July 8, sixty persons were present. Professor Clara E. Cummings, of Wellesley College, spoke on the reasons why we visit the mountains and what the Appalachian Mountain Club can do. After alluding to physical exercise, the enjoyment of the views, and the fascination of the woods, she dwelt at length upon the varieties of trees, shrubs, ferns, lichens, and alpine and sub-alpine plants to be found and studied. The alpine and sub-alpine plants number fifty-four species. By cutting paths, taking photographs, and collecting for an herbarium, the Club can assist in the study of plants with reference to their environment and the changes caused by cutting and burning.

The meeting closed with an interesting exposition of Hindoo philosophy given by the Swami Abhedânanda.

October 11, 1899. — One Hundred and Ninety-fourth Corporate Meeting.

In the absence of the President and the Vice-President Mr. John E. Alden was elected chairman.

The records of the June meeting and July Field Meeting were read and approved. Twenty-two candidates for corporate membership were elected.

The Recording Secretary announced the appointment by President Herbert of the following committee to nominate officers for the year 1900 : Messrs. Edwin A. Start, Frank O. Carpenter, Alexis H. French, Mrs. A. F. Cutler, and Miss Charlotte M. Endicott. On account of the large number present, one hundred and ninety-five, the meeting was adjourned to Huntington Hall.

Mr. Gorham Dana presented a paper on "The Yosemite Valley." At first the speaker gave an historical sketch of the valley, alluding to its discovery and exploration, the troubles with the Yosemite tribe of Indians, and the setting apart of the region, by the General Government and the State of California, as a public reservation. He then gave an account of his trip to the valley, and described its wonderful features, showing about forty lantern views. The paper concluded with a short statement of the theories held as to the cause of such features in the configuration of the earth's crust, — the theory most satisfactory in reference to the Yosemite being that a portion of the earth's crust had subsided.

November 8, 1899. — One Hundred and Ninety-fifth Corporate Meeting.

President Herbert in the chair.

The records of the last meeting were read and approved. One hundred and twenty-five persons were present. Nineteen candidates for corporate membership were elected.

Professor C. E. Fay, in well chosen words, paid a fitting tribute to Mrs. Delia D. Thorndike, who died at Nice, October 30. Her great interest in the Club, her desire to assist in its work, and her willingness to serve upon committees were mentioned, but special emphasis was placed upon her great love for nature and her sympathy for humanity. Mrs. Thorndike joined the Club March 28, 1883, and became a life member January 13, 1893. By her will she has bequeathed to the Club the sum of one thousand dollars.

The Councillor of Improvements, Mr. Parker B. Field, presented an extended report, showing the season's work by the Club and others, and mentioning the paths which still need attention.

Professor Alfred E. Burton, of the Massachusetts Institute of Technology and one of the Commissioners of the Topographical Survey and Map of Massachusetts, addressed the Club on "The Recent State and Town Boundary Surveys of Massachusetts." The speaker first gave an historical sketch, reading passages from the early grants of the Crown. He then described the controversies over the various State lines and the work so far done to fix the bounds of the States of New Hampshire, Vermont, Rhode Island, and Connecticut. He dwelt at length upon the careful work, which has just been completed, in surveying and marking the New York boundary. Interesting incidents in the work were mentioned, and lantern views were shown illustrating instruments, signals, and monuments, as well as scenery.

November 22, 1899. — Special Meeting.

President Herbert in the chair.

About two hundred persons were present. Notices of the December and January meetings were given, and attention was called to the public subscription for the purchase of Cathedral Ledge, North Conway.

President T. C. Mendenhall, of the Worcester Polytechnic Institute, addressed the meeting on "The Controversy over Alaska." The speaker was one of the Commissioners on the Alaska Boundary, and was formerly superintendent of the United States Coast and Geodetic Survey. An outline of the history of the territory was given from its discovery by Behring to the present time. The treaty of 1825 between Russia and England was critically discussed clause by clause, the best map of that period, Vancouver's, being thrown upon the screen. Subsequent and contemporary maps were presented, showing the line as claimed by the opposing parties, and views of mountain scenery proved there was no range parallel to the sea. The speaker predicted that the controversy would ultimately be settled by arbitration, the resulting compromise not being to the advantage of America.

December 13, 1899. — One Hundred and Ninety-sixth Corporate Meeting.

President Herbert in the chair.

Nearly two hundred persons were present. In the absence of Mr. Lawrence, Mr. Ritchie assumed the duties of Recording Secretary. The report of the previous meeting was read and approved. Fifteen persons were elected to membership.

The speaker of the evening was Professor Charles E. Fay, and his subject was "Most Recent Exploration in the Canadian Rockies and Selkirks." This work was in continuation of the investigations and explorations in these mountain regions, to which the speaker has devoted a portion of each summer vacation for several years past. Last summer the Canadian Pacific Railway brought to the region three skilled Swiss guides for the benefit of mountain climbers. In company with two of these the first ascent of Mt. Dawson was made. The story of this ascent formed the principal feature of the paper, which was illustrated throughout by lantern views. An account of this ascent will probably appear in APPALACHIA, Vol. IX., No. 3. Incidentally Professor Fay spoke of minor trips, one of which was to Emerald Lake in company with Mr. Charles G. Saunders, who later in the evening spoke briefly of the region under consideration and of the Kootenai district. Mr. Charles H. Ames, who likewise visited the Canadian Alps last summer, called renewed attention to the beauties of Lake Louise.

January 10, 1900. — One Hundred and Ninety-seventh Corporate (Annual) Meeting.

President Herbert in the chair.

One hundred and thirty-five persons were present. The records of the last meeting were read and approved. Ten candidates for corporate membership were elected.

Miss Helen E. Endicott read her report as Councillor of Art, and the report of the Councillor of Exploration, Mr. Charles L. Noyes, was presented, but not read. Mr. J. Ritchie, Jr., read the reports of the Excursion and Room Committees, and Professor C. E. Fay presented in a few words a report of the exhibitions of the Sella Collection during the past year.

The annual reports of the Treasurer, Trustees of the Permanent and Reserve Funds, Auditors, Trustees of Real Estate, and of the Corresponding and Recording Secretaries were presented.

(For all the above reports, see the official section of this number of APPALACHIA.)

On motion of Mr. Harvey N. Shepard, Chairman of the Trustees of Real Estate, the following two votes were passed : —

The Appalachian Mountain Club gratefully recognizes the donation by Mrs. Edson C. Eastman, of Concord, N. H., of a portion of Three Mile Island in Lake Winnepesaukee, and hereby extends its thanks to her therefor.

The sincere thanks of the Club are given hereby to Mr. John Charles Olmsted for his kindness in making an examination and preparing a scheme for the improvement of the Joseph Story Fay Reservation in North Woodstock.

Professor E. A. Start, Chairman of the Committee on the Nomination of Officers for 1900, reported as follows : —

For President, Albion A. Perry; for Vice-President, John E. Alden; for Recording Secretary, Rosewell B. Lawrence; for Corresponding Secretary, John Ritchie, Jr.; for Treasurer, Rufus A. Bullock; for Councillor of Natural History, Leon S. Griswold; for Councillor of Topography, Frederic Endicott; for Councillor of Art, Mabel C. Chester; for Councillor of Explorations, Charles L. Noyes; for Councillor of Improvements, Parker B. Field; for Trustee of the Permanent and Reserve Funds (for three years), Isaac Y. Chubbuck; for Trustee of Real Estate (for four years), Augustus E. Scott.

The balloting resulted in the election of the candidates nominated.

The retiring President, Mr. Herbert, appointed ex-President R. F. Curtis a committee to escort the President-elect to the chair, and in a few words welcomed him to the office. President Perry expressed to the Club his appreciation of the honor conferred upon him and his wish to serve the Club to the best of his ability.

Professor Alfred E. Burton, of the Institute of Technology, exhibited and explained sections of trees upon which blazes and other surveyor's marks had been made. Attention was called to the annual layers of new wood which gradually cover the marks, and acquire the reversed impression of the same, and it was shown how these specimens were valuable as evidence in court in litigation regarding boundary lines.

January 19, 1900. — Special Meeting.

President Perry in the chair.

About one hundred and ninety persons were present. Notices were given of the annual reception, February 9, the snow-shoe excursion to Jackson, February 17 to 26, and meetings to be held in February and March.

Professor William Morris Davis presented a paper entitled, "Glacial Erosion in the Valley of the Ticino, Switzerland" (see p. 136). The principal feature treated was the "hanging valley." This and the general subject of erosion were finely illustrated by stereopticon views.

February 14, 1900. — One hundred ninety-eighth Corporate Meeting.

President Perry in the chair.

One hundred twenty persons were present.

Dr. J. Norman Collie, of London, England, and Mr. Walter D. Wilcox, of Washington, D. C., were elected Corresponding Members. Twelve candidates for corporate membership were elected. In behalf of Mr. Walter D. Wilcox, Professor C. E. Fay presented to the Club a portfolio of five beautiful photographs of scenery in the Canadian Northwest. Thanks were voted to Mr. Wilcox for this artistic gift.

The President read an invitation to the Club to take part in extending an invitation to the International Geographical Congress to hold its next session in America in 1903, and upon vote of the Club he appointed as a Committee on the subject Mr. A. Lawrence Rotch, Professor W. H. Niles, and W. M. Davis.

The subject of legislation against signs near parks and parkways was referred to the Council.

A paper entitled "The Great Glacier of the Illicilliwaet, British Columbia," by Messrs. George and William S. Vaux, Jr., of Philadelphia, was read by title (see p. 156). Mr. George Vaux, Jr., who was present, showed and described a large number of beautiful lantern views of the glacier and the adjacent region, taken by himself and brother.

"An Ascent of the Grand Combin," by Dr. C. F. Judson, of Philadelphia (see p. 127), was read by Mr. R. F. Curtis, Sella's view of the mountain being shown upon the screen.

"The Seventh Geographical Congress at Berlin," by Mr. Henry G. Bryant, of Philadelphia (see p. 166), was read by Mr. A. Lawrence Rotch, who represented the Appalachian Mountain Club as delegate to the Congress, and who took this opportunity to report.

Mr. Rotch supplemented Mr. Bryant's paper with these remarks: "At a Congress so wide in scope it is somewhat surprising that mountaineering was not recognized, and that no alpine clubs were represented. Nevertheless, the sphere of geography was extended so as to include the atmosphere, the recent explorations of which were described by some of the International Aeronautical Committee, viz.: the work in Europe with balloons by French and German members, and the work with kites in America by the speaker. Practical demonstrations of balloon-ascents and kite-flights for scientific purposes were given. The lateness of the season was probably the reason why so few Americans were present, the most prominent being General Greely, who was an honorary vice-president. As would be expected in Germany, the social side of the Congress was well developed, the entertainments being numerous and often elaborate. Before the meeting in Berlin, excursions to various parts of the empire were conducted by specialists, and at its close, by invitation of the Geographical Society of Hamburg, a large number of guests spent three days in that city."

Officers for 1900.*President.*

ALBION A. PERRY, 291 Broadway, Somerville.

Vice-President.

JOHN E. ALDEN, Newton.

Recording Secretary.

ROSEWELL B. LAWRENCE, Tremont Building, Room 745, Boston.

Corresponding Secretary.

JOHN RITCHIE, JR., P. O. Box 2725, Boston.

Treasurer.

RUFUS A. BULLOCK, Tremont Building, Room 1049, Boston.

Councillors.

Natural History, LEON S. GRISWOLD, Boston.

Topography, FREDERIC ENDICOTT, Canton.

Art, MABEL C. CHESTER, Brookline.

Explorations, CHARLES L. NOYES, Somerville.

Improvements, PARKER B. FIELD, Milton.

Trustees of Permanent and Reserve Funds.

ISAAC Y. CHUBBUCK. CHARLES H. FRENCH. REST F. CURTIS.

Trustees of Real Estate.

HARVEY N. SHEPARD.

CHARLES E. FAY.

AUGUSTUS E. SCOTT.

J. RAYNER EDMANDS.

CHARLES L. NOYES, *Ex-officio*.

Members added since March, 1899.

HONORARY MEMBER.

Vallot, Joseph, Paris, France.

CORRESPONDING MEMBERS.

Collie, J. Norman, London, England.

Wilcox, Walter D., Washington, D. C.

CORPORATE MEMBERS.

Names of Life Members are printed in small capitals.

Abbot, Mrs. Edwin H., Cambridge.	FISHER, WILLIAM P., Brunswick, Me.
Adden, Willard P., Reading.	Fleischer, Charles, Dorchester.
Allen, Norwood Penrose, Germantown, Pa.	FLINT, WARREN F., Somerville.
Andrews, William Clafin, New York City.	Foster, Miss Gertrude W., Roxbury.
Baker, Amos P., Boston.	Fuller, Frank L., Boston.
Baxter, Charles S., West Medford.	Gammon, Miss Maud G., Lynn.
Boies, Miss Eleanor E., Roxbury.	Gates, Miss Elizabeth M., Roxbury.
Bourne, B. D. B., Somerville.	Greenwood, Miss Henrietta F., Newtonville.
Boyden, Roland W., Boston.	Haley, Miss Mary A., Somerville.
Brett, Franklin, Brookline.	Hall, Charles Cuthbert, New York City.
Brown, Frederic H., Boston.	Hall, Miss Gertrude, Somerville.
Brown, George H., Quincy.	Hardwick, Miss Rose S., Cambridge.
Brown, Mrs. George H., Quincy.	Hastings, Frank W., Boston.
Burbank, E. R., Boston.	Hawes, Miss S. M., Yonkers, N. Y.
Burbank, Miss Margaret H., Brookline.	Herbert, Mrs. John, Somerville.
Chakravarti, Satis C., Boston.	HEWETT, MISS MARY C., Canton.
Chickering, Miss Caroline E., Dover.	Hill, Nathaniel G., Malden.
Corse, Hugh R., Malden.	Hills, Mrs. Wm. H., Somerville.
Cummings, Prof. Clara E., Wellesley.	Hodgdon, Mrs. Susan M., Chelsea.
CUSHING, MISS EDITH S., Cambridge.	Holden, William, Leominster.
Cushing, Miss Elizabeth L., Medford.	Hooper, Sumner R., Cambridge.
Darling, Miss Emma C. S., Somerville.	Howard, James C., Boston.
Darlington, Stephen P., Philadelphia, Pa.	Hyde, Frank C., Boston.
Decrow, Miss Gertrude, Roxbury.	Jones, Mrs. Gardner M., Salem.
Dole, Arthur E., Concord, N. H.	King, George R., West Somerville.
Emery, Justin F., Wollaston.	Knight, Miss Delia, Brookline.
Estep, Miss Elizabeth C., Dorchester.	KNOWLES, ARTHUR J., Boston.
Farnum, Mrs. Mary Rolfe, Penacook, N. H.	Lloyd, Henry D., Boston.
	Maccarty, Miss Martha E., Cambridge.
	Marden, Miss Abbie E., Cambridge.

- Martin, Miss Sue R., Haverhill.
 Mayhew, Miss B. E., Cambridge.
 Maxwell, George, Charlestown.
 Morgan, William M., Boston.
 Morgan, Mrs. Wm. M., Boston.
 Morley, Miss Margaret W., Boston.
 Morton, S. Frank S., Newton Centre.
 Myrick, Miss Florence E., Chelsea.
 Newhall, Francis W., Jamaica Plain.
 Page, Miss Elizabeth H., Boston.
 Paige, Miss Abbie L., Taunton.
 Parker, Mrs. Henry M., Medfield.
 Patridge, Eugene E., Boston.
 Paul, Miss Florence H., Newton Centre.
 Penney, Miss Margaret J., Watertown.
 Pickering, Miss Annie M., Roxbury.
 Polk, Miss Mary, Dorchester.
 Poor, Miss Helen W., Derry, N. H.
 Poore, Miss Harriet P., Boston.
 Porter, Mrs. Alice H., Brookline.
 Potter, Miss Mary E., Arlington.
 Pratt, Mrs. Ada L., Boston.
 Rand, Miss Marguerite, West Somerville.
 Rand, William H., Jamaica Plain.
 Rogers, Edward L., Boston.
 Sanderson, Miss Edith R., Charlestown.
 Sanderson, George A., Charlestown.
 Sanderson, Mrs. George A., Charlestown.
 Scott, Edmund D., Holyoke.
 Scott, J. Stephen, Jamaica Plain.
 Seamans, Miss Sarah Ella, Brookline.
 Shurtleff, George F., Boston.
 Sibley, Miss Emma M., Newtonville.
 SMITH, Miss C. Louise, Boston.
 Smith, Miss Florence Van D., Brookline.
 Snell, Miss Hattie A., Holbrook.
 Stantial, F. G., Melrose.
 Stantial, Mrs. F. G., Melrose.
 Stark, Miss Elizabeth A., Cambridge.
 Stark, William F., Cambridge.
 Sullivan, Miss Abby H., Roxbury.
 TAFT, Miss LEONORA E., Boston.
 Thayer, Herbert A., Boston.
 Torrey, Miss Emeline E., Roxbury.
 Torrey, Miss Grace, Roxbury.
 Tyler, Alexander, Boston.
 Tyler, Mrs. H. W., Newton Centre.
 VAUX, GEORGE, JR., Philadelphia, Pa.
 Whitney, Mrs. Minetta J., Watertown.
 Williams, Mrs. Rufus P., North Cambridge.
 Willis, Reuben, Somerville.
 Willis, Mrs. Reuben, Somerville.
 Withington, Miss Anna S., Brookline.
 Withington, Miss Harriet L., Brookline.
 Withington, Miss Susan E., Brookline.
 Wood, Miss Mary E., Brookline.
 Woodman, Mrs. E. Dora, Boston.
 Woodworth, Albert B., Concord, N. H.
 Woodworth, Edward B., Concord, N. H.
 Worthley, Frank O., Boston.
 YEATON, GEORGE W., Concord, N. H.



Photogram.

John Budenick, Son.

MT. DAWSON.

From a Photograph by George and W. S. Vaux, Jr.

APPALACHIA.

VOL. IX.

BOSTON, APRIL, 1901.

No. 3 & 4.

Our Quarter-Centenary.

THE present issue of APPALACHIA quite nearly marks the twenty-fifth anniversary of the founding of the Appalachian Mountain Club. The year 1876 witnessed during the month of January three preliminary meetings of persons interested in mountain exploration with a view to a possible organization; and in February the perfecting of such an organization; in March occurred the Club's first meeting for the presentation of papers — a meeting to which the public was invited and nearly two hundred responded; and as early as in June there came from the press the first number of APPALACHIA, the embodied expression of the new society's vitality and the promise of its permanence.

It is fitting that after the lapse of a quarter of a century we should pause gratefully to consider the way we have trodden and the place that the Club and its magazine have filled during this somewhat extended interval, to compare anticipation with realization, to take an inventory of our ideals, and to find encouragement as we enter upon our second period, coincidently, with the opening of the new century.

To one turning the leaves of the earliest issue of the Club's journal, the most striking fact is the similarity of that pamphlet to its latest numbers, a fact bearing testimony to two things: the foresight of the founders of the magazine, and loyalty to the ideals that were cherished at the inception of the Club. Even the external appearance differs but slightly: it is the same octavo in its familiar cover of brown, characterized by the same simplicity, bearing nearly the same legends in almost the

identical fonts of type. All is practically unchanged, save that the Club seal lends an element of modest ornament, — an innovation introduced immediately after the adoption of our device in 1884. With its sixty-two pages it is less bulky than our present issues, that sometimes double that number; and yet, taken together, numbers one and two of the first volume, which represent the first year of the Club's activity, fill one hundred and thirty pages with most interesting matter, — an amount bearing favorable comparison with the output of any later year.

Before we turn to examine the contents of those numbers, a word of grateful acknowledgment and appreciation is due to one who, more than all others combined, may be said to have laid the foundations of our literary edifice so broadly and securely, — to Mr. Samuel H. Scudder. With full faith in the future of the new society, with the requisite knowledge of methods from his training as a scientist and bibliograph, he grasped the somewhat elaborate scheme of the Club's organization in all its details, and gave to it in APPALACHIA (the very name is from him) a nearly perfect expression. When, after the completion of the first volume, he turned the chief control over to untried hands, the charge was accepted with many misgivings, and even doubts whether matter would be forthcoming to complete a second volume up to the standard of the first. But never has his interest and coöperation failed; often has the magazine been favored with valuable special articles from his pen; and when, after eight years of valuable service, Mr. T. W. Higginson retired from the chairmanship of the first Publishing Committee, — a directory first established in 1884, — this office most naturally devolved upon Mr. Scudder, who still continues to devote to it his generous service.

A glance within those earliest numbers shows the traditional division into a section composed of special papers and an official section, the former consisting of articles read at the meetings, the latter of reports of officers and proceedings of the Club. Perhaps the most significant variation from present usage is the presence there of spring reports of the Councillors; for in those days two reports were presented annually, one as a sort of programme for the coming summer's work, the other announcing in the autumn what had been accomplished. Naturally these

spring programmes after a few years came to embrace about everything remaining undone in the several departments within the Club's more limited field ; wherefore, even with the most energetic pursuance of the plan, performance lagged in the rear. Hence it is not surprising that, as early as 1880, they disappear. So, too, in the following issue, that of May, 1881, was printed the last President's address, a paper laboriously prepared each year by the outgoing incumbent upon some special scientific or possibly æsthetic subject, the preparation of which the By-Laws made the least enjoyable perquisite of presidential honors. Apart from these omissions the make-up of the magazine remains essentially unchanged.¹

In a sense the history of APPALACHIA is the history of the Club, at least in so far as it interests the general public. What the Club has accomplished, apart from the enrichment of the lives of its members, has found a complete expression upon its pages. The present offers an appropriate occasion to see how far the Club has fallen short, if at all, of the hopes and promises of its founders, and how far it may have exceeded them. To this end, and as a directrix to our thought, let us read together, after this passage of a quarter of a century, the paragraphs which, under the title "Introductory," opened the first number of the magazine : —

The Appalachian Mountain Club was organized early in 1876 for the advancement of the interests of those who visit the mountains of New England and adjacent regions, whether for the purpose of scientific research or summer recreation. It will be seen, by reference to the Constitution of the Club, that provision is made for five departments of work, each of which is placed under the guidance of a member of the Council selected for that purpose. The Club will carry on a systematic exploration of the mountains of New England and adjacent regions, publishing its results from time to time, and will collect books, maps, photographs, sketches, and all available information of

¹ The first five numbers, to Vol. II. No. 1, inclusive, were printed by our fellow member, Mr. A. A. Kingman, though all but the first number were handled by Messrs. H. O. Houghton & Co. That earliest issue bears the imprint of A. Williams & Co. From Vol. II. No. 2, to Vol. VIII. No. 2, inclusive, the press-work was done by Messrs. John Wilson & Son. Since Vol. VIII. No. 3, Messrs. Houghton, Mifflin & Co. having become the sales agents of the Club, the printing has been done at the Riverside Press.

interest or advantage to frequenters of the mountains. It will also encourage the opening of new paths, clearing of summits, from which views may be obtained, and other improvements.

At the same time, the Club, recognizing the importance of connecting its special work among the Appalachians with the general results of investigation elsewhere, will encourage the study of comparative geography in general, opening its meetings to contributions, both scientific and popular, on zoölogical and botanical geography, geology, topography, hydrography, travel, and exploration. It will collect works upon these topics, with maps, charts, and photographs of all parts of the world, and by the customary courtesies of exchange and correspondence, will enter into relationship with organizations of a similar character elsewhere.

The publications of the Club, of which the present is the first, will include reports of its meetings, papers upon the physics, geography, and natural history of these regions, and specific directions for investigations in the field. The results of each year's work will also be given in full, illustrated by maps of the various places visited. The Club desires to collect all the information possible regarding the attractions of various portions of the mountains, the accommodations of the various inns, and, in fact, all such information as would be of interest to the artist, pedestrian, or student. Members and others are requested to collect all facts concerning the designation of mountains now known by different names; for while it would be absurd to replace a well-established name by another merely for caprice, yet a careful examination and discussion of the facts in the case will enable one to form a much more correct estimate of the propriety of applying a given name to a mountain than any evidence obtained in a single spot from a half dozen of the residents. This is especially important in the case of a mountain near Conway, known as Pequawket, Kiarsarge, and Kearsarge, and the mountain near Campton and Sandwich, known as Black or Sandwich Dome, since both these are important Coast Survey Stations. In a future number some of these will be discussed; and should the demand for a publication of this character prove sufficiently great, a second part of the volume may be expected at no distant day. Eventually it is hoped that the Club may be able to publish a detailed and accurate map of the White Mountains upon a large scale, and in the very best style of workmanship; much of the summer's work of its members will be devoted to that end, and preliminary maps of portions of the field will be published in APPALACHIA from time to time, in preparation of the completed chart.

The paramount object of the new Club speaks in nearly every line of this carefully digested programme: it was to be a working society for the exploration of *the mountain*, preëminently of the mountains of New England as lying nearest at hand, but broadening beyond these limits as far as the remotest bounds where these expressions of the majesty of the Creator lift their exalted summits. It would, for its immediate field, annex to New England the adjacent regions; it would open its meetings to contributions on travel and exploration; it would collect data from "all parts of the world." In brief, as all the physical features of our globe are interrelated, this scheme sets forth the essence of a geographical society, with the mountain as a rallying point, from whose summit, as it were, all the other features should be dominated in the view. The first retiring president, in his address,¹ sets this clearly forth: —

In organizing we met . . . the first rock on which we came near splitting, . . . our name . . . and the more vital problem of our objects. Some wished to form a geographical society, and that our work should be mainly scientific, with the walks and explorations as a secondary feature. . . . The adoption of the name Appalachian Mountain Club, with the objects given in our Constitution, seems to have been a wise step. It gives us, and was intended to give us, a very wide scope. By Appalachian . . . we should include everything east of the Mississippi, while by "adjacent regions" some insist that the Himalayas and even the lunar mountains should be included.

If this choice of name and objects was divined to be "a wise step" in the dim light of one year's experience, what shall be said of it after the lapse of a quarter of a century? Under this name the organization has pursued these objects, the nearer and the remoter, partially eliminating some of them by an exhaustive treatment, yet replacing them with kindred new ones, and always harmoniously; for, strange to tell! never once in all these years has a quarrel or acrimonious dispute occurred in a single meeting, — until to-day the name which had such a strange sound in contemporary ears is known on two continents, receiving honored recognition in the legislative halls of its native State.

Of the five departments originally devised all have continued

¹ APPALACHIA, Vol. I, page 63.

active, and each has contributed its share to make the pages of APPALACHIA a repository of interesting information. To one of them, Exploration, the present year has witnessed the addition of a second charge, Forestry, an interest that has largely developed within the last decade.

As might be expected with regard to a field so accessible, important scientific articles pertaining to New England have grown fewer with the years. Geodetic formulæ and their discussion, elaborate collations of barometric and micrometric measurements of heights, sheets of accurate profiles, no longer appear upon our pages; but from time to time the specialist still has occasion to refer to current issues of APPALACHIA for some article treating of the exploration of the air, ice caves, the alpine orthoptera of North America, or glacial erosion in the valley of some Italian torrential stream.

But in no particular is the variation of subject matter, within narrow limits, more clearly marked than in the matter of special articles resulting from the exploration of the White Mountains, to which the founding of the Club gave a surprising impetus. To one who to-day visits the White Hills in company with some well-informed Club member, and listens to him as he names the least obtrusive swells on the horizon, and recounts his experiences enjoyed in repeated ascents of the remotest wilderness peaks, or in his days-long rambles over the loftiest craggy sky-lines, it would doubtless seem strange to be told that when this Club was formed large numbers of these glibly-named summits were unchristened, — yet, what was almost worse, a few were struggling for recognition under half a dozen names,¹ — and that only the rare visits of lumber surveyors or unusually aspiring hunters had ever disturbed the solitude that had surrounded scores of those peaks since their creation. Yet

¹ The "burning question" of duplicate names, to which so great prominence is therefore given in the last paragraph of the "Introductory," has meantime died out for lack of fuel. Notwithstanding a different impression in some portions of New Hampshire, the Club has always maintained the sane and conservative view of name changes set forth in this preamble. As showing how little argument can effect questions of the sort, it may be remarked that, so far as one of the two mountains alluded to is concerned, there is no more consensus of opinion to-day than there was twenty-five years ago. We have simply agreed no longer to moot such questions.

such is the fact. The forest glens of New Hampshire were, some of them, almost as little known of men as valleys of the Caucasus or the Himalayas. APPALACHIA recounts, page after page, how this veil of mystery was gradually stripped away; how fair nooks and flumes and graceful waterfalls were discovered; how paths were constructed to grand heights for the benefit of the average tourist; and how parties of "Appalachians" went without path or trail through the unbroken forest mile after mile, enjoying in a little way the surprises of the explorer and in a large way the delights of the rambler over sylvan heights and rocky, far-viewing crests. As early as 1880, four years after the founding of the Club, Mr. W. H. Pickering, in the last spring report of a Councillor of Exploration, could write: "The White Mountain region has been so thoroughly explored during the past few years, that the Department feels the scope of its work very rapidly diminishing. But in the regions adjacent, especially to the north and northeast, a good deal still remains to be done." He then gives a "table of the less visited peaks of the White Mountains," thirty-five in number, of which eighteen had by that time been described in APPALACHIA. In the autumn of the same year he says: "There are still sixteen White Mountain summits of considerable importance of which we know but little." In 1883, Mr. Eugene B. Cook, one of the most indefatigable climbers ever numbered in our membership, was elected Councillor of this Department. It would almost seem as if he had registered a vow to leave not one of these sixteen mysteries unsolved. Exploration sweeps them down like a well-directed ball among the innocent tennpins. Appendixes to the reports of the Department make ruthless demands on the bourgeois fonts of the University Press. In 1885 the fell purpose is accomplished, and the victor is able to remark with admirable nonchalance, "When the present Councillor entered upon office, there still remained thirteen of these peaks lacking the recording pen of an explorer; but during the past two years all of these mountains have been described in APPALACHIA."

This ill-concealed glee may be all very well from the point of view of a strenuous Councillor, but who can fancy the feelings of a Publishing Committee, with a now widely recognized

periodical in their hands, at this wholesale slaughter among the subjects for future special articles! No magazine can live by threshing old straw. The purple haze of romance has faded from a mountain when once its mystery has been expressed in type. The later visitor, even if he enjoys much, feels that he has no fresh material to report to his fellow-members; and with the cessation of papers before the Club comes the exhaustion of supply for a periodical, the chief reason for being of which is not that of a popular magazine, innocent entertainment, but to be the reflection to the larger public of the subjects furnishing forth the meetings of the society for which it stands, "a bond of interest to the non-resident members and a representative of the Club to other similar organizations."

This practical exhaustion of subject matter from the White Mountains coincides approximately with the end of the first decade of the Club's history. About this time "the adjacent regions" begin to attain a larger importance. The gradual growth of this feature it is interesting to observe. Timid at first, it does not for nine years pass beyond the confines of the North American continent and its adjacent islands. In 1885 it leaps the Atlantic, and henceforth recognizes the world as its sphere.

Distinctly Appalachian territory, the mountains of North Carolina and the Catskills, first lured us out of our New England limits. In the first six years the Club's only wider journeying was when, in 1878, with "A Partial Ascent of Sierra Blanca," we were introduced to the Rockies of Colorado, destined later (after 1887) to become a favorite source of supply for our meetings and magazine. Eastern Cuba was heard from in 1883, Jamaica in the following issue, and an Alaskan volcano (Makushin) in 1884. The Alps first figure in the issue of June, 1885, with a paper on the Zinal Rothhorn by Mr. F. H. Chapin, followed at rare intervals by other papers on high ascents in those mountains, — few in number, because this field had already long been preëmpted by Europeans, and was furnishing a voluminous literature easily accessible. More specialized work seemed called for by an American society. The geographical world was desirous to know what wonders and beauties this continent contained, perhaps concealed. From

1885 until the most recent meeting of the Club, the unexplored recesses of our Cordilleras, — the Rocky Mountains, the Wahsatch, the Sierras, the Canadian Alps, — have furnished an unceasing fund of material for the astonishingly well-attended meetings of the Club.

No better place will offer to speak more fully of this point, than which none is more eloquent as to the wise management of those intrusted with the furnishing of material for the monthly meetings, and the loyal interest of the membership. Probably few, if any, societies in New England can boast a better record of attendance. Scanty memoranda exist for the first seven years, though mention is made in official reports of large numbers present. The attendance at 210 meetings between July, 1883, and February, 1900, appears to have been 23,350, an average of 111 at each meeting. The smallest number is 26, the largest, 500. Other large meetings have numbered 400, 300, 290, 265, 250 (several times), — chiefly on occasions when the Club has invited the public to share its pleasures.

The Club has fulfilled its promises also as regards other publications. A glance at the third page of the cover of APPALACHIA shows that three valuable books bear its imprint, two of these beautifully illustrated small octavos on Colorado and the Cliff Dwellers by our recently deceased corresponding member, Mr. Chapin, the third being the well-known "Walks and Drives round about Boston." Besides these, and one little guide to a section of the Adirondacks, the Club has issued eight maps of interest to considerable constituencies. In several instances the execution of these maps has been the work of United States or State surveys, yet in some of these the Club, or its members, have lent their aid, and in all cases it has been the means of securing their issue in available form for public use. The preparation for the publication of such an elaborate map of the White Mountain region as was contemplated in 1876 ceased when the United States Geological Survey began its work in this field.

The prophecy of a special library, suggested by the words, "it will collect works upon these topics," has come true in a larger measure than probably the writer of those words could have forecast. From the heterogeneous collection of Government reports and stray pamphlets that at first were huddled in

greatest inaccessibility in the physical laboratory of the Institute of Technology, and scarcely more visited than a Mt. Tremont or a Carrigain — which later were arranged in due order, with growing accessions, in the alcove kindly furnished by the Club's ever cordial ally, the Society of Natural History — from this collection to the 1500 volumes of scientific works, alpine literature, and books of travel (to say nothing of its 1300 maps) that year by year are threatening to force the Club into yet more ample quarters, it is indeed a far cry. So, too, the collection of the Department of Art, that from the most meagre beginnings now indeed comprises "photographs of all parts of the world," with its magnificent Sella views in the Alps, Caucasus, and St. Elias region, and entire albums of exquisite work by members of the Club from negatives taken on manifold explorations and excursions at home and abroad. Probably only a minority of the Club members have any adequate intimacy with these.

"The customary courtesies of exchange and correspondence" have added quite extensively to the Club's wealth in books and pictures. In 1877 Mr. Scudder, presenting in APPALACHIA a "List of Alpine Serials," the first bibliographical list of this nature, could say: "The following catalogue embraces all serial publications of alpine clubs, or independent journals devoted to mountaineering, concerning which any information could be obtained." This list contains seventeen, or, more strictly speaking, fifteen entries. Of the societies publishing these a few have ceased to exist. Of the survivors, ten are upon the Club's present list of corresponding societies, together with thirty-eight more recent strictly alpine European correspondents, twenty-four foreign geographical societies, twenty-eight American organizations, and some twenty-two less readily classified exchanges, — a total of one hundred and twenty-two. Nearly all of these societies publish serials.

It was natural that a club with no financial resources, such as was ours at that time, should be guarded in its promises to perform works demanding an outlay of money. It will be observed that in those salutatory paragraphs it is said, that "it will also encourage the opening of new paths, clearing of summits . . . and other improvements." This work, which had

begun before the first APPALACHIA was issued, has never halted since. Larger enterprises, also, such as the construction of camps, refuges, and observatories, have been undertaken. The publication in this same issue of a complete table of existing paths and camps under Club control renders any further specification here unnecessary. That its encouragement has taken the very substantial form of meeting the bills is shown by some digits hiding away in the printed table of "Expenditures for first twenty-five years," appended to the Treasurer's report for 1900. The very respectable sum of \$4726 represents the amount of this "encouragement."

And this leads us to consider the growth of the resources and expenditures of the Club. They have kept pace with the healthy increase in membership. The society, which at the close of its first year numbered 134, now numbers 1236 members, an average annual increase of about forty.¹ The admission fee and annual assessment during the earlier years were each two dollars. The former is now five dollars, the latter three. The entire receipts of the first year were \$295, as against \$6442 for the year 1900. From the beginning the financial management has been judicious. Upon becoming incorporated in 1878, there was inserted in the By-Laws a clause ordering that "the Council . . . shall have no power to subject the corporation to any liability beyond the amount of the corporate funds." In the day of small things, as later on when larger resources were at its disposal, no Council has been tempted to overstep this wise limitation. Apart from the two funds, one of which may not be expended and the other only by two deliberate votes, there has annually been a good balance upon the Treasurer's account.

Into the first year's income of \$295 entered \$43 from sales of APPALACHIA and accompanying maps. Indeed, the first Treasurer's report (which occupies but twelve lines on page 109 of Volume I.) covers, besides assessments, entrance fees, and expense of printing, postage, etc., only the items of expense for

¹ For a detailed presentation consult the table of curves (Plate XXXVIII.) published with this issue. The largest increase of membership in a single year was 103 in the year 1881; the smallest, 1 in 1890. In 1884 there was a slight decrease of 5, and in 1888 of 7 members. The decrease indicated for 1878 was rather apparent than real. (See Vol. II. p. 61.)

APPALACHIA No. 1 and receipts from its sale. Out of the scanty income, merely \$252, at the disposition of the Council for the year 1876, the liberal sum of \$140.86, more than 55 per cent., was appropriated for publications. Even with the increasing demands of later years this agency of the Club's work has never been stinted, so that a grand total of \$21,434 represents the expenditures of twenty-five years for this item. The entire expenditure for this period, exclusive of appropriations to the two funds, being \$57,809, it appears that 37 per cent. of the expenditures have been made in this department. The income from sales in the same period has netted the Club \$7102, about one third of the cost. In the first years, when the annual fee was small, APPALACHIA depended for its circulation wholly upon sales to the members as well as to the public. The edition was small, merely five hundred copies, the illustrations were few and seldom expensive. When, in 1882, the annual assessment was raised to three dollars, the magazine became a perquisite of membership. The size of the edition has necessarily kept pace with the increasing membership, until it has reached two thousand copies. Expensive illustrations now appear in every issue, so that the cost of a single number has amounted to over \$725. The greater part of the edition being distributed gratis to members and exchanges, the income from sales at present bears a trifling proportion to the cost.

The only other item of expense which in magnitude bears comparison with that for publications is the one for room-rent. For the first ten years of its existence the Club had no home of its own. The welcome guest of the Institute of Technology, for its public meetings and sessions of the Council, and permitted to utilize an alcove of the Natural History Society's library for its books, it managed to ward off the feeling of homelessness for nearly a decade. Members of the Committee that was appointed to make inquiry as to securing a headquarters for the Club recall to-day with a smile the modest ideas with which they set about their investigation. Its chairman was the then President, Col. T. W. Higginson. A small room, perhaps thirteen feet square, on the east side of the Ticknor Mansion on Park Street, the view of its one window out upon the brick wall of the Union Club's building, was the first seemingly

possible selection. The annual rental would have been perhaps \$275. But by chance a neighboring door, to room 17 on the front, stood open, revealing the beautiful view over the Common. This, and not the fact that the room itself was in every way more commodious, enlarged the Committee's ambition, and, with no slight misgivings as to their culpable extravagance, they determined to recommend a room demanding an expenditure of \$400 annually. To save the Club treasury, and possibly their first proposition, they coupled with this recommendation another, that the rental be met by subscription. Both recommendations were adopted, and the Society secured a beautiful home in December, 1885. A year later the Recording Secretary in his annual report said: —

This method of paying the room expenses is not advisable for future years. Not only is it unpleasant to solicit subscriptions year after year for the same object, but some members are probably deterred from using the room on account of inability to subscribe. The best policy, therefore, is for the Club to assume the room expenses.

In the Treasurer's report for 1889 the item "Donations for the Club room" disappears. Here at No. 9 Park Street were the headquarters of the Society for ten years. But in 1896 the Club, true to its ideals, aspired to higher things. The tenth floor of the Tremont Building, then approaching completion though the access was still by ladders, attracted to its dizzy heights a new Committee. One of the first tenants of the finished structure was this Club, confidently assuming an annual rental for its rooms of \$1100, an amount since increased, by the cost of storage warehouse and other facilities, to over \$1200. In view of all the practical advantages, it is probable that no one regards this as an extravagant outlay. While it fosters the social aspect of membership, that is only an incidental fact. Nothing is more obvious upon a study of the finances of the Club than that mere social enjoyment has never made the slightest drafts upon its resources. Rather has this feature been a factor strengthening them; almost never has even the Committee on the Annual Reception reported a deficit in its accounts, while on the other hand this Committee and that on Excursions have in all turned over to the treasury for general purposes the handsome sum of \$1855.

The readiness of members to subscribe toward anything that shall be at once a valuable possession of the Club and a source of enjoyment to all its membership is most manifest in the swiftly consummated work of securing a summer home by Lake Winnepesaukee. An entire island, some forty acres, with a commodious bungalow, has been secured within a twelvemonth, at a total cost of over \$2500. The story of this enterprise is told in the pages of this issue of APPALACHIA. The generosity of Mrs. Eastman and the indebtedness of the Club to Mr. R. B. Lawrence, for eighteen years its indefatigable Recording Secretary and a wise inspiring and directing influence, will not fail of due recognition.

It would be an agreeable task to enlarge upon the excursions aspect of the Club's activity, a feature obviously in mind from the outset, as seen in the quotation already given from the address of Professor E. C. Pickering, the prime mover for the Society's organization. The detailed presentation made by ex-President Mann at the close of the first decade of the Society's existence, and printed in APPALACHIA, Vol. V. No. 2, taken together with the report of the Excursion Committee of 1900, printed in the present issue, bears witness to the perennial interest of these outings. Perhaps those who recall with an affectionate remembrance those earliest excursions, when the mountain world was almost as fresh as when created, may be a little envied by the later generation of excursionists; but, after all, Nature is always new each early summer, and "where one has never been before," as Professor Huntington said in one of our earliest meetings, "a first visit is always an exploration." If the Appalachian Club has deserved well of the human race, it is for what it has done in twenty-five years in bringing city-bred humanity, men and especially women, face to face with Nature.

It may, however, claim recognition for more tangible results of wide public value. It has never sought its own, but, systematically and always, "another's wealth." If it has a Permanent and a Reserve Fund, aggregating \$7500, this also is merely incidental. Hoarding its income has never been its aim. The Reserve Fund exists to further worthy enterprises, such as the guide-book for the vicinity of Boston. While it does not care to sink money in such ventures, it does not hesitate in view of

such a possibility, if the end aimed at is a good one largely considered.

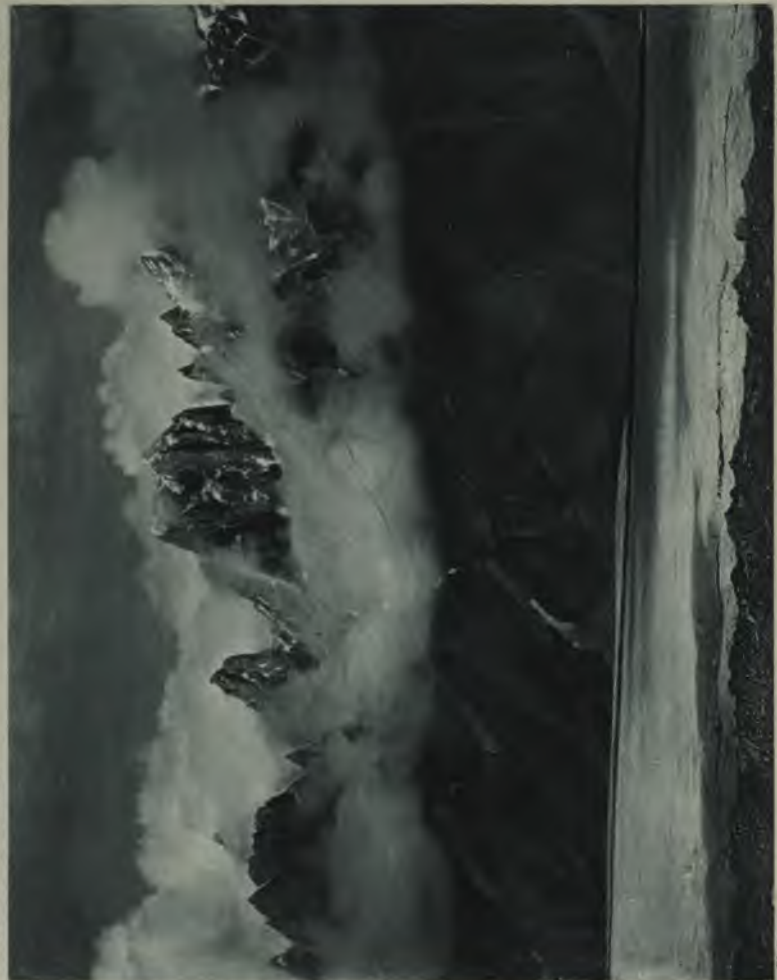
More than by money, however, it has aided noble enterprises by its hearty sympathy and earnest advocacy. The great Metropolitan Park system of Boston and vicinity came into being through the agency of the Trustees of Public Reservations in Massachusetts. To quote from Mr. Sylvester Baxter (than whom there is no more competent witness), in his article on "A Trust to Protect Nature's Beauty" in the current (February) number of *The Review of Reviews*, "The movement for the organization of this body . . . was started by the Appalachian Mountain Club, in the spring of 1890." Not only was the initial movement towards the creation of the Metropolitan Parks Commission inspired by this Club, — and primarily, let it not be forgotten, through the efforts of its then Councillor of Topography, the late much-lamented Charles Eliot, — but the bill for the creation of the Commission was supported at the legislative hearing and advocated at special meetings by the official representatives of the Society. Could the Club point to no other result of its activities beyond its share in this movement, which has already invested \$10,000,000 of the State's capital in perpetuity for the health and enjoyment of the people, it would not have reason to regret the time and effort of so many devoted men.

The name of the Appalachian Mountain Club has gained by such advocacies a good standing, at least with the public men of our own State. And so when, in 1893, the Legislature was petitioned to extend its charter to enable the Society to hold real estate, powers were granted it without opposition that differ from those enjoyed by the State's own Trustees of Public Reservations only in the added right of that body to acquire holdings under the law of eminent domain. There is no limit in extent or value to the amount of such possible holdings by the Club, and they are exempted from taxation if not exploited for gain.

Moved by a desire to bear a part in preserving the sylvan beauty of the mountain districts of New Hampshire, it has been the Club's ambition to acquire similar holdings in that State. In truth, this was the chief and ulterior aim in securing the extension of the Club's charter under Massachusetts law, — for

by the law of our neighbor State a foreign corporation enjoys similar privileges to those established under its own laws. Acting under this motive, the Club has acquired through gift three small holdings and one of considerable size, which it maintains at its own cost, and holds in trust for the public as completely as any public park is so held. To maintain such lands demands an outlay of funds. Without a considerable amount set apart for such maintenance, especially if subject to taxation, the Trustees of Real Estate (constituted by vote of the Club in 1894) would have to be cautious in the acceptance of gifts and bequests, to say nothing of restraining their enterprise in soliciting them. In view of the motives of the Club, and in particular of the benefit which could not but inure to New Hampshire from important holdings by such an organization of forest lands in the region which for its beauty annually attracts millions of dollars to the State, it is to be regretted that the bill recently introduced into the New Hampshire Legislature, asking for the same exemption which the real estate of the Club enjoys in Massachusetts, was defeated. It is confidently believed, however, that this defeat is not final, but that a clearer understanding of the situation will at some future day bring about the passage of such a bill by a large majority.

The present number completes the ninth volume of APPALACHIA. It has been deemed appropriate to mark the beginning of our second quarter-century by the publication of a double number and one that should peculiarly represent the old and the new of our Club's life. Profiles of the horizon seen from two of our neighboring hills do duty for those elder day products of its topographical camera. The mountains of New England are again heard from in pleasing echoes from the past, while "the adjacent regions" assert their bold claim to the lion's share of space. The story by a Massachusetts woman of her ascents of Himalayan peaks to an altitude very rarely reached by man, and never before by one of her sex, introduces us for the first time to this field, except as we have been permitted to gaze on the crown of the world through the eyes of members back from Darjeeling. The Canadian Alps, recognized by the world of alpinists as in some sense an appanage of



THE BIAFO WALHALLA.

From a Photograph by Dr. and Mrs. Workman.

our Club, again appeal for recognition, as worthy to allure to their exploration at least as large a contingent of the membership as was engaged in the actual work of investigating the recesses of the White Mountains in the first decade. So long as these two fields preserve, the one its beauty, and the other its mystery and grandeur, there is no danger of a diminution in the freshness or size of our Journal, nor in that loyal love of Nature on which the Appalachian Mountain Club is substantially founded.

Pioneer Ascents In Baltistan (Himalayas).

BY FANNY BULLOCK WORKMAN.

Read September 19, 1900.

AFTER several years' absence in the East, I much appreciate the privilege afforded to-night of speaking to my own countrymen, and more particularly to people of my own State, of our climbs of last year in high Asia.

As I said a few weeks ago at the International Alpine Congress at Paris, it was on French soil, when contemplating Mt. Blanc from the Jardin, that I was first seized with snow and ice fever. But the first love of the hills was aroused in me many years before, when we passed several summers in the White Mountains and, lingering on the slopes of Clinton and Pleasant and among the crags of Mt. Washington, I realized that there was no beauty like the beauty of the mountains, no atmosphere — whether in storm or fair weather — equal to that which enshrouds them, and no solitude so soul-satisfying as that which reigns on the arêtes and summits of the eternal hills.

We must all cherish an affection for objects that have instilled in us a love of the beautiful, and so before I ask you to accompany me to the snows on the other side of the world, I would pay my tribute of respect to the New Hampshire hills, the only ones, I regret to say, that are at all known to me in this land of varied and fine scenery.

Our party, consisting of Dr. W. H. Workman, Mattia Zurbriggen, myself, and about fifty coolies and servants, left

Srinagar, Kashmir, on July 1, and passed by the upper Deosai route to Skardu and Shigar. Thence crossing the Skoro La, 17,000 feet, in three marches we reached Askole in Braldu at the foot of the Biafo, Punmah and Baltoro glaciers.

The Skoro La is one of the most beautiful and varied of the numerous mountaineering passes crossed by us in our two summers in high Asia. I use the term "mountaineering pass" in counter-distinction to ordinary passes such as the Zozi La and Namiki La on the route to Leh. Difficulty is not, however, necessarily contingent upon height in the Karakoram passes, some of 14,000 feet offering more so-called "mountain technicalities" than others of 17,000. They told us at Skardu that it was too early in the year to cross the Skoro La; that it was not yet open. But when among the valley-loving people of the eastern mountain world, it is not well to place too much credence in such remarks, and so we decided to attempt opening it for the season, if any such necessity really existed.

Two to three hours' march from Shigar brought us to Askor nullah, to a village shaded by apricot trees, at the opening of a wild ravine leading to the pass. Some time was lost between the calling of the coolies from the fields by the lambardar and the desperate raiding upon the fruit trees by our servants, and it was well on toward ten o'clock before we succeeded in disposing of our kit upon the backs of the most voluble set of men we had yet met with.

The trail up the Askor ravine winds under frowning precipices, or sometimes in a mere trace clambers over steep, slippery snouts of adjacent rock-peaks. Between these heights the Askor torrent bore down upon us with a deafening roar. After four or five crossings we found we could no longer continue in safety, and decided to halt in a stony widening of the ravine at the base of a grand dolomite-like peak.

Notwithstanding an early start the following day, we were six hours reaching the base of the pass. As the vegetation grew scantier, the air colder, and the sun sank lower, the coolies began to falter and some complained of feeling ill. Fearful of not crossing the pass before nightfall, we urged them on, but to little purpose, for a number fell down with their loads and rent the air with moaning. Finally, at 15,800 feet, we saw

that it was necessary to bivouac as best we could on a narrow bleak edge of the arête leading to the stony face of the col between two deep nullahs, down which rock avalanches thundered throughout the night.

One small tent was pitched on this projection. Zurbriggen and the coolies slept under the rocks, the latter adding their direful groans to the rock cadence of the mountains, until sleep brought them relief. At 4.30 A. M. we broke camp, with the glass at 32° F., and the men seemingly recovered from their malaise. It was curious to see how this comparatively low altitude affected these natives, who during the summer months not infrequently cross the pass.

The south face of the pass is a wild scree-covered wall, bare of snow in early July. From the beginning the north face is descended over a wide crevassed snow-field, which ends in a long glacier. To the east of the pass a dazzling circle of snow peaks develops as the traveler descends. Although grander, they resemble closely the well-known summits seen from the Gorner Grat, Monte Rosa, the Lyskamm and Castor and Pollux. But we shall return to this circle later on.

The coolies, now jubilant at the prospect of the long descent, glissaded the snow-fields regardless of crevasses and of our camp treasures. And thus we approached Askole.

Askole has been aptly called "the world's end;" the name is given to seven villages scattered about this distant valley, each with its separate lambardar or chief. The principal collection of huts, connected with the outer world only by a flimsy rope bridge, and the trackless ice rivers toward Hunza and Turkestan, is in truth a last gîte for humanity, the final dot of green on the ragged edge of a world of rock and snow.

After eleven hours' hard marching we reached this bridge, which spans the wide Braldu River, with some trepidation. This particular bridge ranks as one of the longest (270 feet) and the most trying in a country where such catenaries are not uncommon. It is not a pleasant sensation, particularly about mid-stream, to find one's self swinging over such a turbulent river as the Himalayan snows produce.

In Shigar the Askole people are spoken of as Braldu men. They are of Tibetan origin, although Mahomedan in religion.

They are a cheerful, noisy lot, differing essentially from the long-faced, whining Kashmiri. Naturally good mountaineers, they can go loaded wherever it is necessary; but much forcing is required to make them do this, for like the Kashmiri, they prefer to huddle about a camp-fire and gossip through the hours of a summer day.

We were to follow up the Biafo glacier for more than thirty miles to the Hispar pass. This sort of thing was not in the daily program of Askole people, and it took three long days for the different lambardars to assemble coolies and get together the necessary provisions.

No one had been up there since Sir Martin Conway and party had descended the glacier in 1892. The chiefs seemed to be all new men, and the only souvenir of the Conway party was Sir Martin's "chit" of reference, which was handed us by lambardar Kinchin, who was to be the chief of our band.

He had not been with Mr. Conway, but he now owned the testimonial, and, as he spoke Hindustani, he was to play the complicated rôle of leader of the men and interpreter. He wore the cast-off linen coat of an English sahib, and carried a cotton umbrella. As ruler of the men he proved a failure, but he was always dignified, even when chattering with cold among the séracs.

We left Askole on the 16th of July. Two hours' march brought us to the beginning of the glacier, where all paths cease, and the tiresome moraine work common to great glaciers begins. A recession of the snout of the glacier has taken place in late years. Colonel Godwin Austen tells us that in 1861 the end abutted against the cliffs of the south side of the Askole valley; now it but reaches the line of the north side. Zurbriggen, who was with the Conway party in '92, also found great changes in the first twelve miles of our route, it having become much more heavily crevassed, and broken into séracs, and consequently more difficult to explore.

We ascended the high lateral moraine at a point over a mile from the end of the glacier, thus cutting off in distance, and obtaining a speedy foothold on the ice. The march continued all day over great truncated séracs, divided by deep crevasses. The ice, although often very slippery, was generally concealed

by a varied covering of detritus of mud and sand. Boulders of granite, white quartz, sandstone, and shale lay all about, sometimes bridging the crevasses. We made fair headway, and toward night left the glacier, and, climbing to a high alluvial terrace, encamped at a height of 11,775 feet.

The next day, as we attacked the glacier, we foresaw hard and slow work ahead. Giant honeycombed séracs arose in frosted pinnacles as far as the eye could reach, and, to supplement the labor entailed in getting through them, a light coating of new snow covered ice and detritus. The crevasses were longer and wider, and seldom spanned by bridges. We sought for a passage not far from camp, but found none on that side. We then crossed to the centre, and tried our luck amid a reach of séracs rising like a huge white tongue fifty or sixty feet above our trail.

As we spent hours cutting steps over and around them, our feet chilled by the ice and fresh snow, I recalled the short march made some years before through those of the Glacier des Bossons, on what was to me then a first and wonderful ascent of Mt. Blanc. Those were in a baby glacier of Europe; Asia was showing us here the real primeval ice-flow.

After losing much time we succeeded in bringing the coolies through, until we came upon two especially tall séracs separated by a profound crevasse. On the side of one of these Zurbriggen had to cut a gallery fully thirty feet long. It took him a half hour to do this, while we, meantime, sat cooling off on a neighboring white ice-shelf. A number of the older coolies began to remonstrate and talk of returning, and, as may be imagined, they were answered with considerable asperity. The gallery finished, we passed through and settled ourselves on our mackintoshes for another cool period of waiting. I don't know that one masters the lesson of patience in India, but one certainly learns to wait, sometimes for hours, sometimes for days, whether in the hills or on the plains.

Owing to the projection of the icy walls, the coolies could not follow loaded, so that the loads had to be handed through the passage first. To accomplish this, Kinchin and our bearer were placed in the gallery to hand the packs, some of which weighed sixty pounds, to Zurbriggen, who stood at the most

precarious point, one leg astride the crevasse and his foot braced against the opposite sérac. He passed them on to two camp servants stationed on a lower shelf to receive them.

Last of all came two sheep, which were to serve for food later on. One was safely landed on the further side, the other, owing to inexperienced handling, slipped into the crevasse and disappeared from sight. This proved too much for the tender feelings of Zurbriggen, who insisted that two of the men lower him on the rope into the crevasse. The lamb was found shivering but unhurt in the blue depths, and was safely extricated from its cheerless surroundings. We warmed ourselves by taking a snap-shot at Zurbriggen, as he was being drawn up after the rescue.

We next reached a couloir, through which we pushed with all possible alacrity, but too soon our efforts to reestablish our circulation were brought to a close. A flat ice surface was reached, and we were confronted with huge bridgeless crevasses that could not be jumped.

"And now you must let me seek for a passage," said Zurbriggen. "Very well," we replied, and prepared for another icy time of probation. He found no passage, and, as the weather was thickening and the day advanced, after consultation we decided to return to the old camp for the night. We retraced our steps, the coolies retiring, as they always do, with an ease and swiftness they never show on an outward march.

The following day we remained in camp while Zurbriggen, accompanied by Kinchin and his cotton umbrella, made a reconnaissance. He went to the east side, but saw no chance of advance, and curiously enough later found that the only practicable negotiation was at the point we had left, where he finally discovered a bridge.

Thus losing a full day, we set out again on July 19, passing the great sérac belt successfully by noon. We kept to the smoother parts, but the coolies, with their characteristic dislike of ice, followed the westerly ridge, which again brought them into a labyrinth of séracs. We had to cross over to them and bring them out. We tried to find an encamping place on the right bank, but huge séracs and crevasses barred our efforts, and, crossing to the left bank after two hours' struggle among border séracs, we reached a stony plateau at 12,900 feet.

On July 20 we came to Boggy Camp (13,600 feet), on the west bank, a sandy hollow at the entrance of a side nullah (ravine) leading to a group of glorious snow-peaks. These side glacial valleys constantly open upon the Biafo, revealing peaks of Mt. Blanc-like form, rising in untriangulated splendor to fully 24,000 and 26,000 feet, while unexplored glaciers of greater dimensions than the Aletsch sweep down to the main colossus. Poor words fail utterly to express their pristine glory.

We passed four days at Boggy Camp, the weather being unsettled. This was the last point where wood was found, and we employed the time in sending a supply to Ogre Camp for future use.

We were favored with many weathers at Boggy Camp, — rain, wind, and snow, varied by wonderful breaks, when scenes of cloud-swept peaks made very looking a pleasure, known only to the lonely interloper of this world above all green things. We again broke camp on July 25, with barometers rising, and after an hour in rough moraine reached the centre of glacier.

Ogre Camp is situated on a southern spur of one of the most beautiful mountain massifs. It consists of a small grass-covered projection from a rock slant, and overhangs the glacier by two hundred feet. Our tents were pitched upon three small terraces. Opposite us rose a huge falerie of granite walls and peaks. It splits mid-way from its base into spires and domes, rising snow-sheathed, where snow can lodge, to 21,000 or 23,000 feet, and puts to shame all the aiguilles of the Alps. We named this group the Biafo Walhalla.

I must here speak of the wonderful massif rising to the north of Ogre Camp. From its immense ramparts innumerable airy needles pierce the blue at 9000 feet at least above the glacier, and at 23,000 above the sea. Photographing this mountain from the Biafo on a cloudless day, when it filled the whole deep blue of heaven with unparalleled, inaccessible rock majesty, we christened it Mt. Meru, or the mountain of the sun, for one of the two mythical Olympi of the Ramáyan.

“ Full in the midst King Meru, best
Of mountains, lifts his lofty crest,
On whom of yore, as all have heard,
The sun well-pleased this boon conferred :

On thee, O King, on thee and thine
 Light, day and night, shall ever shine.
 Gandharvas, gods who love thee well
 And on thy sacred summits dwell,
 Undimmed in lustre, bright and fair,
 The golden sheen shall ever share."

From it two good-sized glaciers descend to the Biafo, while its rear snows aid in forming a wide valley to the north. We took six views of it from different points, but none of them do full justice to its varied and majestic beauty.

At Ogre Camp, on the bleak but interesting perch at 14,650 feet, we passed three nights. We were often stormed in, but between storms we paid a visit to the glacier and obtained many views with our cameras.

About six hours above Ogre Camp the Biafo opens into Snow Lake, a vast basin of ice and snow, original, I believe, in the Himalayas. It is encircled by unnamed, uninvestigated snow peaks, varying in height, apparently from 20,000 to 24,000 feet. From Ogre Camp the ascent is gradual, but constant. We reached the entrance, which is at 16,000 feet, at two in the afternoon. The snow, which was mostly fresh, had become soft; and, as the danger of falling into unseen crevasses was constant, we roped. In spite of great care, I did nearly disappear in one wide one. The coolies, lightly loaded, followed in our spoor. The march was slow and trying, with soaked feet. Finally, we began the ascent of an ice slant, where each step had to be cut, and, late in the afternoon, encamped on a narrow ice shelf at 16,450 feet at the base of a rocky cliff. This we called Ice Camp. A packet of fagots, presumably left by the Conway party in 1892, was found.

Time fails, or I should like to speak of the glory of that night's sunset upon Snow Lake, stretching its virgin wastes on every side to the feet of the nameless gods that guard it, where

"Northwards soared
 The stainless ramps of huge
 Himalas wall,
 Ranged in white ranks against
 The blue-untrod,
 Infinite, wonderful."

The night was clear and still, the minimum temperature 21° F. At six the next morning, leaving our camp, we started



CRESCENT GLACIER FROM MT. BULLOCK WORKMAN.



ICE CAMP ABOVE SNOW LAKE; 16,450 FEET.

From photographs by Dr. and Mrs. Workman.

for the Hispar pass. The ascent led at first over a long snow slope and later over a sharp crest. It was necessary to make several détours to avoid certain immense crevasses. One of these assumed almost the shape of an ice canyon, a great azure abyss filled with jutting blue stalactites and grand icicles, through which the sun's rays scintillated with magic effect. We walked along its side, seeking in vain the bottom of its icy depth.

We reached the top of the pass (17,435 feet) at 8.30. Unlike most cols, it is a great ice defile bounded on both sides by exquisite peaks. It bears to the south, downward amid a scene of inexpressible grandeur, which culminates in the wonderful snow peak, B. 15, fixed by the Trigonometrical Survey at 23,900 feet, and which bounds on the southwest a long arm of Snow Lake.

Col. Godwin Austen sketched B. 15, from a height above the Punmah glacier, in 1861. We concluded to draw upon Hindu mythology once more, and call the grand summit Mt. Kailasa, spoken of in the Ramáyan sixteen times, now as "Kailasa's lofty crust," again as

"Mt. Kailasa's topmost height,
Where ores of every tint are bright."

Like its lower confrère, the sacred Kelas of Tibet, it might worthily become the object of worship of devout Hindus. Its remoteness from human habitations and its extreme inaccessibility must, however, for all time prevent its assuming the popular rôle of fetich mountain to all creatures less ethereal than gods.

To the right of where we sat on that cloudless day enjoying our simple tiffin stood a beautiful Weissborn, which we should gladly have attempted to scale, had not Zurbriggen felt ill and declared himself unfit for further exertion. Beyond the snow ridges at this Weissborn, on the right side of the Hispar, you see a fine tent-like height, rising from the sloping snow banks. On the left, towering in unbroken snow slopes, is a peerless cone, resembling certain views one sees of Nanda Devi, the goddess of Kumaon. Bewildered by the beauties of the Hispar, we sat silent, communing with the spirit of the mountains, which Colonel Durand, in his book, *The Making of a Frontier*,

has, with the instinct of the true mountain lover, thus feelingly described: "It always seems to me that it is only in the heart of the great mountains, thousands of feet above the last trace of human habitations, when you lie by some timeworn rock, lulled by the silence which can be felt, and gazing at the eternal snows, that the real voice of nature speaks to you."

We returned to our tents, through which rivers from melting snow were coursing to the detriment of camp chattels, which were speedily removed by the servants. The barometer had been falling all day, and by 9 P. M. all hands were busy piling stones on the tent cords to keep the howling wind from precipitating us into Snow Lake. Such are the variations of weather that may be expected at any minute in these regions.

We descended to Ogre Camp the next day in a snowstorm, and left it on the morning following in a still more severe one. It was a gruesome march, and by nine o'clock we were crossing the glacier in four inches of snow, a blinding sleet storm cutting off all sight beyond the next half yard. Casting about, we at last found a reach of the eastern medial moraine, which we followed until the weather improved a bit.

We returned to Askole in long marches, descending in half the time it took to ascend. The seven lambardars in their best clothes, together with the ladies of Askole decked in their most striking jewelry, stood on the mud-house tops to welcome our entry into the village. We remained two days there to rest and collect coolies for our next trip.

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We again left Askole on August 5, for an exploring tour in the Skoro La range, with thirty new coolies under lambardar Kinchin. He still carried his cotton umbrella, much battered, under his arm, but had added more substantial clothing to his outfit, to meet the varied temperatures which he knew he was bound to encounter with us. For the last time, crossing that most unpleasantly mobile of rope bridges, we climbed the south wall of the valley to the nullah leading to the Skoro La. Following this up to the limit of wood, we encamped at 14,200 feet.

As the peaks came in view we selected a lovely silvery horn, the first to the east of the Pass, and decided to push toward it the following day.

On the 6th we reached the glacier, fording several torrents on the way, and bearing up the crest of the right lateral moraine. It was narrow and steep, and ascended sharply toward another fine glacier, that descended in chaotic séracs from the circle of summits above. Seeing the nature of the country we were heading for, the coolies began their usual overture, the refrain of which is ever the same: "Please, sahibs, go back to wood and grass."

This we naturally refused to do. We wished to cross the higher glacier and make an ice camp. Continuing our way we attempted this, but the men clamored and finally threw down their loads. As they could not be persuaded, we pitched camp on the border of the ice. The moraine ledge was barely safe from boulders falling from a mighty rock peak behind, but we made the coolies build up rock terraces for the tents. We had thought to remain perhaps two nights in this uncomfortable perch at 16,200 feet; but, as it proved, five nights were passed here at Avalanche Camp, and a sixth at a still higher altitude. The situation was unique, and in every sense of the word what in the German language would be called a *hochgebirg* one. Above us snow and ice alone reigned; below, only moraines, the lower Skoro La glacier and bare mountain flanks were seen. The temperature at this camp was fairly low at night, the minimum on three mornings being 30°, 29°, and 48° F.

At 5 A. M., on August 7, accompanied by two of the braver coolies as porters, we crossed the glacier leading to the base of the selected peak. Fine weather was indicated, and we were full of anticipation of this our first virgin ascent.

An ordinary Swiss guide would have been puzzled, and probably would have lost some hours finding his path through the maze of séracs and crevasses that faced us. But Zurbriggen was not one of these. He led us in and out and over them, as if a path had existed. In less than three hours we had conquered the séracs and were breakfasting on a sloping plateau. From here some rather steep slopes of the main peak were ascended, and above these came an hour's rough climbing over rock slabs. Then the final snow slopes began. Climbing these without especial difficulty we reached a lower rock summit. There our porters, who had been complaining of their heads,

threw themselves down and were asleep in two minutes. We went on to the main top, which is a long narrow snow cornice. We were five and a half hours from camp to the summit. The height, taking the average of the Watkin patent and the Cary aneroids, was 18,600 feet. The view was very fine. Ridge upon ridge of Korakoram and Hunza peaks rose to the north and east, among which Masherbrum was clearly seen.

We named the mountain the Siegfriedhorn. The porters built a strong cairn on the lower rock summit, which crowns a ragged shaly wall that falls several thousand feet in a sheer precipice on the Shigar, or south side. On the descent a good deal of soft snow was again met with, particularly on some beds of névé, and unseen crevasses had to be looked out for.

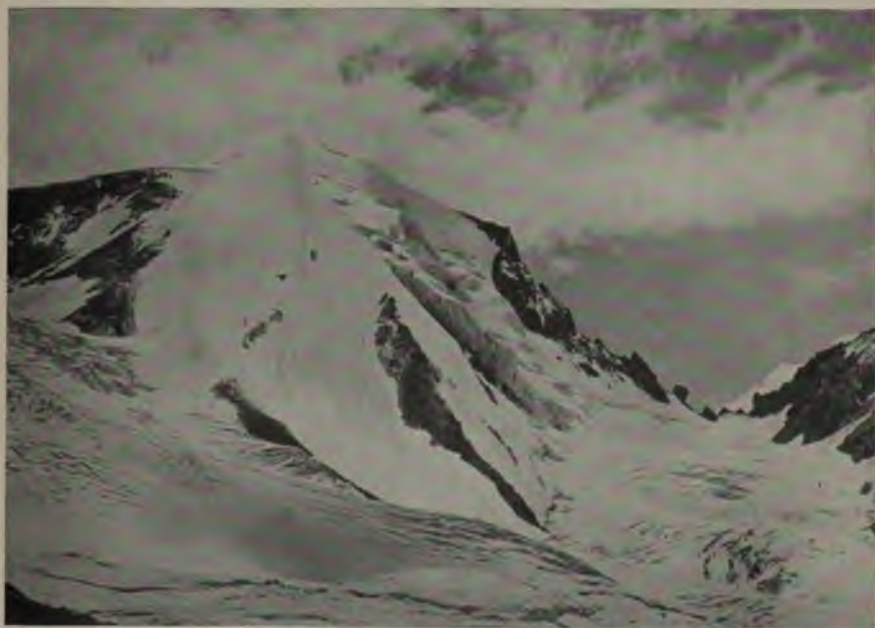
Weather detained us two days at Avalanche Camp. We intended to try for a beautiful white cone, the fifth removed from the Siegfriedhorn, and the first of three snow-corniced peaks which we called the "White Fates." The glacier descending from this peak was tremendously crevassed and broken into thousands of séracs of great size. The height of one ice fall above our tents was at least 500 feet. We might possibly have ascended over its side, but coolies could not be taken through, and a higher camp for the final climb was necessary. Zurbriggen went out during the detention at camp, to see what could be done. He decided that an exceedingly steep talus to the left, descending from a rock peak, would have to be ascended, and then a rock shoulder exposed to falling stones traversed.

On the morning of August 10 we started, taking only a few men and the barest camp necessities in the way of kit. Kinchin wisely remained behind, leaving to the sahib and bearer the task of driving the unwilling coolies. After wrestling for an hour with a sharp moraine and the abrupt talus, which was composed of rock and loose fine detritus lying at a steep angle, we had one of our most thrilling coolie scenes. Time fails for me to describe it. Suffice it to say we made them go on, and even got them over the nasty rock shoulder, where we were all in imminent danger from falling stones for twenty minutes. After this the exceptional difficulties of the day were over, and we found a spot on the glacier, which had been selected for a camp from the top of the Siegfriedhorn.

MT. BULLOCK WORKMAN



THE WHITE FATES FROM AVALANCHE CAMP, 16,200 FEET.



SIEGFRIEDHORN AND SKORO LA FROM AVALANCHE CAMP.

From photographs by Dr. and Mrs. Workman.

This was the best of our very high camps, at 17,375 feet. We dubbed it Haunted Camp. It was on ice, lightly covered with moraine, fairly level and protected from wind. From it we took another view of the Siegfriedhorn, the pass, and the mountain on the other side.

At six o'clock on the morning of August 11 — a cloudless day, with a temperature of 21° F. — we continued our ascent of the new mountain. I say continued, for we all felt it had been well begun the previous day. We were again accompanied by the two porters, who, shod in hobnailed boots, loaned them by the tent servants, had become fairly expert in placing their feet in the steps cut.

A sharp reach of moraine and glacier brought us to a bold crevassed slope, which led to higher snowfields. The surface was very icy, and step-cutting began immediately. We were roped from the first, and, as we ascended higher in zigzags to an icy snout overhanging a basin one thousand feet below, it was far from inspiring to hear Zurbriggen continually calling to the coolies to move carefully and keep the proper length of rope between them. This advice was given in a polyglot dialect of German, Hindustani, and English, which made no serious impression on the porters, for, at a critical point, they sat down to remove snow from their boots. "A misstep here and we all perish," remarked Zurbriggen, as the coolie began to lace his boot with Oriental slowness. It was very cold for the first three hours, our route being on the shady side of the mountain.

There was no rock work, the ascent being from the first, after the glacier, over a succession of ice and snow slants. The last arête, about four hundred feet in height, rose at an angle of fully 60°, and proved long and fatiguing, owing to new snow, which lay quite fifteen inches deep.

We reached the top (19,450 feet) at ten o'clock, thus completing the ascent which really began at Avalanche Camp eight hours below. Considering the rock-climbing between the two camps, and the combined snow and ice work from Haunted Camp to the summit, this mountain proved much more difficult than the Siegfriedhorn, and may be classed, Zurbriggen says, among peaks of the first order, even in a land of giants.

We ate our breakfast with good appetites and, except for some headache and loss of breath on any quick exertion, did not suffer from the altitude. We named the mountain Mt. Bullock Workman,¹ and left our cards with record of ascent and name in a glass jar in the snow. Unfortunately this is by now most probably buried where no man will find it.

To the east, by looking over the edge, down a perpendicular of several thousand feet, was seen a huge and important glacier which swept far away, winding among escarpments of wild peaks. This great stream we called Crescent glacier. Below the arête in the foreground, the glacier made a bend and bears down to a valley leading from Askole. The lower part is indicated on the Survey map, but not the upper part, which we are the first to photograph. Nearly the whole course of it may be seen from Mt. Bullock Workman, but owing to its position, directly beneath where we stood, the lower part could not be photographed. Following up the arête rises the magnificent pyramid of K 2, the world's second highest. In the foreground, tipped with snow, its precipitous granite ribs rising from a glacial basin, is the fixed peak, Trans-Indus 13, or Mungo Gusor, 20,602 feet, the mountain to which I referred in the Biafo description. Well marked bergschrunds grace its flanks, and grandly it rears its inaccessible walls above the glacier.

To the northeast, beyond Mungo Gusor, overtopping rugged lesser hills, soared the fixed peaks, B. 15, D. 16, and No. 11. In looking over some original drawings made by Colonel Godwin Austen in 1861, we found the forms sketched by him

¹ Lest any one should think us overbold in giving names to two pioneer hills in the Himalayas, I will state that the Survey of India recognizes on its maps only Indian names, or the numbers which they themselves give, for purposes of identification, which accounts for such markings as "B. 15 no. 11," placed over certain fixed peaks. I received a very cordial congratulatory letter from Colonel St. G. Gore, R. E., Surveyor General of India, upon my three ascents, and, when talking with him later, he remarked that there was not the slightest reason why we should not give the summits the names chosen, and that he could see no ground for criticism. I mention this, because certain persons in India, not having made first ascents themselves, and being in no way ambitious to have others do so, inquired with especial care as to whether we had consulted the Survey of India in regard to naming peaks.

The Survey of India has shown great interest in our trip, and in our discovery and first photographs of the new Crescent glacier from Mt. Bullock Workman, and in our photographs of the various great fixed peaks from this summit.

corresponded almost exactly to the outlines first photographed by us forty years afterward. Facing our summit to the southwest, separated from us by glaciers only, rose the king of our own snow cirque, a lofty airy vision seamed by bergschrunds, swept by never-ending avalanches, a fit abode for all the mythical warriors, Titans, and gods of the Indian epics. It cut the blue of Asia at near 21,000 feet, and before it we bowed; even Zurbriggen could trace no route up its mighty furrowed slopes.

I will not describe the view from Bullock Workman, but merely add that we saw Nanga Parbat, the queen of Chilas, on the western horizon, without a cloud, sheathed far down its slopes in golden snow. The light was such that we could not photograph the peak.

The descent to Haunted Camp was made without accident, although deep wet snow made the steep slants a bit precarious and most fatiguing. We arrived at camp with severe headaches, but what did it matter? We had enjoyed in a day, what a lifetime might never again offer. After some tea, we exerted ourselves, and pushed back to Avalanche Camp, which was reached as darkness set in.

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At the risk of making you ascend far too many glaciers and peaks in a single evening, I must ask you to listen to a short account of our third and highest climb.

On August 12 we recrossed the Skoro La *en route* to the Shigar valley. Ever since leaving Shigar in early July, a grand white dome, facing the valley to the north, had haunted me. We saw it also from Mt. Bullock Workman, but surmounted by a higher peak. The massif, with its chief peak, Koser Gunge, is to be found on the Indian Survey map of the Shigar valley. The main peak, lying behind, is barely seen from Shigar.

We marched up the valley two marches to Yuno, to make the attempt from there. From this village one sees 5000 feet of steep earth and grass slopes, followed by 6000 more of rock wall, end in a broken arête, above which springs a small part of a snowy height. Zurbriggen crossed to the other side of the narrow valley to find out whether a better view of the mountain could be had, for we were not then sure that the top had been seen. He made up his mind which was the summit, but the

valley was not wide enough to enable him to see enough of it to determine how long the ascent would take from the base, 11,000 feet below. We had heard of the mountain in Srinagar, and it was always spoken of as a peak of 21,000 feet or more. We waited three days for coolies to be gathered from the scattered villages, and during this time selected our camps up to 18,000 feet as well as we could through a glass.

On August 20, with a not very promising sky, we started from Yuno in search of our first camp. After seven hours' stiff climbing we came to a grass ledge which had been selected from the valley. This knoll, at 14,600 feet, proved a comfortable place for a camp. Towards evening the clouds moved off, and the weather seemed promising for the morrow.

It was fine at sunrise, but by 8 o'clock misty clouds came in, covering the lower or dome summit. From this camp, which later we christened Wooing Camp, the route lay entirely over gendarmes and arêtes to the snow, and could not be attempted in other than fair weather. These arêtes were soon completely covered, and all hope of striking tents on that day frustrated.

By evening matters looked more promising; the rock battlements again appeared, but, to our discouragement, quite frosted with snow. The following day was again uncertain, with more new snow above, which meant a deeper accumulation on the upper snow-fields. Coolies went to Yuno for extra food, for we were bent upon further wooing of Koser Gunge. The aneroids constantly indicated a low pressure.

The third morning, the index of the Watkin patent made a leap upward, and encouraged by this sign, Zurbriggen set out for the untrodden walls above, to see what sort of a place he could find for a camp. Later, the index of the Watkin aneroid went down, and then set in a morning of hail, wind, and thunderstorm. We pitied Zurbriggen, sitting, perchance, in a cold couloir. He returned toward night, angry with the weather, the great cold he had encountered, and the slippery condition of the rocks.

The fourth morning broke fine and remained so. The sun burned upon the range, rapidly melting the snow, and we determined to risk going higher. Although we might have expected

it, we had not thought the coolies would handicap us at first, but they did. When they were called, they came slowly, and stood about eyeing their loads. On pressure being brought to bear to make them go, they refused and bolted one and all down the mountain-side.

I will not dwell upon the scene at Wooing Camp, where we stood gazing hopelessly at our stationary bags and tents. It is sufficient to say that envoys were sent to where the men halted on a lower spur, and that, after an absurd bakshish had been offered, thirteen agreed to carry our tents to the high camp. They had a rough climb, but finally surmounted the various shelves and gendarmes, and reached the spot selected by Zurbriggen from the valley, 9000 feet below.

This was our highest camp, a wild, windswept, sloping, rock-covered plateau, at 17,900 feet, lying at the base of a bare wall which we were to attack the next day. It was a cheerless gîte, but we thought ourselves most fortunate, for water was found in a rocky couloir near by. A little wood had been brought by the men, and with wood and water, who can complain in a mountain bivouac?

A tent servant and a Kashmir coolie were to accompany us this time on the ascent, the Shigar coolies possessing no proper clothing. The morning broke fairly clear, but windy. For the first 1200 feet we had some severe rock work on the wall, thence a steep ascending arête, leading to a horizontal one, had to be overcome. Steep rock-climbing above 18,000 feet is not quickly accomplished, and it was more than two hours before we arrived at the jutting horizontal arête. Here we passed along a narrow shelf forty feet in length, that projected from a rock mass overhanging an abyss, to a snow basin. At this point no summit could be seen, only a long snow slope leading to another ridge. We stopped for a light breakfast. The sun shone fitfully between heavy clouds, and it was growing colder. The wind blew strong in our faces from the moment we touched snow, and traces of the late storms were apparent in the four inches of surface snow met with at the outset.

On reaching the ridge the summit was still invisible, a shoulder and still sharper slope cutting off further prospect. The snow was getting deeper as we ascended, and was soon well

over the tops of our boots. The second slope led to a huge arête, rising at an angle of full 55°, and so placed as to put us more directly in the teeth of the wind. The cold was growing intense, not so much because of the low temperature (14° F.) as because of the relentless wind, which, combined with the rarefied air, impeded our progress very greatly.

The distant peaks were now shrouded in cloud, and the air was full of storm, but no one spoke of retreat. And still no peak ahead. A great gust of wind blew off my topie, and down it bounded like a snowball over the slant of the arête to lower snow-fields, where it disappeared toward some large crevasses.

Fortunately under it I wore a face mask and cap, but its brim had broken the force of the sleet, which now cut like a thousand sharp needles on my partly exposed forehead.

By noon we had reached 20,000 feet, and the snow came to our knees, — snow dry and mealy, which so chilled and benumbed our feet that we expected frost-bite. The surface beneath the snow was of ice, making our footing on the sharp slants most insecure. Zurbriggen worked hard, treading out every step, and the waiting for him to do this in the snowstorm was more than bitter. The mere lifting of the feet from one deep step to another caused us to pant for breath. We needed food, but could not find the kola biscuits in our pockets with half-frozen fingers. I called to Zurbriggen that I must change my gloves, for I could no longer feel my ice-axe. He scarcely heard the loudest scream at the end of thirty feet of rope. We halted, and he rubbed my hands, and pounded my feet as well as he could. He changed my fur gloves and tied on some rubber mittens, that in time restored circulation. Perhaps we should have turned, but we did not.

We came to a knife-like edge, where the snow was hurled in stinging gusts in our faces; and there, emerging from a cloud, we saw the final peak, a tall snow cone with a blue ice cornice. It was some hundreds of feet removed still, and separated from us by a small snow lake and another arête. The distance seemed great and unsurmountable in that howling storm. We descended, crossed the basin, and attacked the slant in zigzags, a not agreeable process with the ever-present ice foundation.

Besides steadily climbing we had been constantly going backward from the rock face of the mountain and crossing snow areas by no means accounted for in the difference of 2000 feet between its height and that of the summit. The snow portion of Koser Gunge proved to be not simply one peak, but an endless mountain scheme of ridges, slopes, and domes.

On this dangerous incline our Kashmiri porter gave out, and sat down, turning his back to the roped train. There was a pull on the rope; and, looking up, we saw Zurbriggen, with icicles two inches long hanging from his beard, waving his hands and calling. As we heard nothing distinctly he came down a bit. I called, "In mercy's name don't stop here." "Never," he cried, "that would be death; the coolie must go on at once or be left." He shouted, "Come on or leave the rope," which was repeated along the line to the porter.

For a minute nothing was done, and then we told the servant to take what he could himself and unrope the coolie. He shivered and looked dazed, and we saw that he was too overcome by cold to carry more than his camera and water flask. It seemed an eternity and was actually some minutes before the porter was released, and we saw him crawl downward, bearing our extra coats and food in the wrong direction. We trembled lest his unavoidable movements in unroping should precipitate all off that dangerous slope. Thoroughly numbed during the halt by the wind and cold, we plodded on, winning step by step in the pitiless storm the height so long wooed and so hard to conquer. The goal was reached at three o'clock.

The aneroids registered one a hundred feet under, the other one hundred and fifty feet over 21,000 feet. The glass indicated 10° F.

On the blue ice cornice the four winds of heaven were holding high carnival, and it was no place for us, tried by cold to the last enduring point. Glad to retreat, we hurried down as fast as the difficult conditions would allow.

The descent in the still raging storm to the boundary arête was not easy. It was quite two hours before we reached a place where a short meal could be taken, and where we rejoined the coolie trying to keep warm behind his load. Even here there was no rock or sérac to protect us, as we sat for a few minutes

in the deep snow. Three of us at least realized the danger attendant upon climbing great peaks in bad weather, a danger we should not any of us have been willing to incur, had we had an inkling of the storm in store for us upon departure from camp. In these regions, days of march separate one from the nearest village, and on Asia's slopes no friendly club hut is perched, no self-sacrificing relief party of guides gather, when the signal of distress is made by the isolated, ambitious peak-enthusiast.

A word in regard to our measuring of altitudes may be added. As stated in our book, the chief aneroid used during the expedition was a Watkin patent barometer graduated to 24,500 feet, which, so far as we could judge, worked with great accuracy. The highest pressure at all stations where there was opportunity for taking a series of readings, and consequently the lowest altitude, that is to say, those most favorable to the aspirations of mountaineers, are those adopted as probably approaching most nearly to the true altitudes. In several instances the heights corresponding to its readings were a good deal lower than those given by others and indicated on maps. One pass marked on the maps at 15,900 feet, was measured by our Watkin at 15,425 feet. We do not claim that our altitudes are exact, but if the points to which they relate are ever fixed by the Survey, we think they will not be found to differ greatly from the altitudes given.

After our return to Srinagar we made a trip of ten days to the Lidar valley, a much-praised, overrated resort for him whom Mr. Norman Neruda would have called the "valley-pounder." We call it the playground of the bath-tub walking Lidarite, or newly-arrived Kashmir tourist.

Up to the point where the "valley-pounder" usually turns homeward toward Srinagar there is little worth seeing. But one march beyond, at the base of the noble peak of Kolahoi, 17,839 feet, we made a camp, with a view to a reconnaissance of this mountain, a graceful rock mountain rising from its glacier, shimmering in autumn snow. The season was too advanced for an ascent. It snowed each night we were there, on the peak and the glacier, so that, owing to the deep new snow, we were only able to reach the base of the cone at 15,000 feet; but we

decided how an ascent could be made of this grand hill, which fired all Zurbriggen's mountain fervor. It is the Dent Blanche of Kashmir, the Dent Blanche of Switzerland being but a pigmy in comparison with it, according to our guide. The north arête only a Mummery would attempt and then fail to negotiate, affirms Zurbriggen.

I believe I may claim up to date three pioneer record ascents for my sex.

The First Ascent of Mount Dawson.

BY CHARLES E. FAY.

Read December 13, 1899.

THE superb alpine peak of Mt. Dawson is known to but comparatively few of the tourists who have visited the Selkirks. Unless one climbs to some one of the fine view-points that every year are becoming more accessible to the ordinary walker, — to Glacier Crest, Mt. Abbott, or Avalanche Peak, — he catches no glimpse of this giant of the region, and indeed forms no true conception of the zone of yet more impressive grandeur that encompasses the noble valley where Glacier House is nestled.

From the neighborhood of the hotel looking southward one sees the Asulkan névé lifting a silvery white chalice to the sky between the peaks of Castor and Pollux on the one hand, and on the other a lofty ridge, now snow, now rock, that sweeps in a long line from its invisible origin in the eastern arête of Sir Donald. That restful concave is the Asulkan pass, fully 7500 feet above the sea, and nearly half that altitude above the Glacier House.

Could one be transported to where its delicate line forms the lofty horizon-bound, one of the grandest of alpine spectacles would be revealed before him. Across the deep, narrow valley, whose side plunges in a precipitous descent just beyond the pass, there rises a range of striking boldness, and remarkably varied in its mighty architecture. This is Mt. Dawson with its attendant peaks. Lying in a slightly outcurved line from east to west are first the minor dome of Mt. Deville, parted by dazzling snow-fields from the two towering summits of Dawson itself;

beyond these a fine subordinate rock peak, nameless as yet ; and finally, beyond the low-cut Donkin pass, the graceful pyramid of Mt. Donkin.

Although the Dawson range ends here, the eye is attracted still further toward the west by a grand array of distant glacier-bearing peaks of the boldest and most aspiring shapes, their chaotic sierras the more impressive by contrast with the dusky profundity of the narrow Fish Creek valley, beyond which they spring, and which leads on toward their unexplored fastnesses. But not for their inaccessible glories need we overlook the fine mountain nearest at hand of all. Right opposite to us, and but slightly to the left, stands Mt. Fox, a northerly outpost of the Dawson range, connected with it by a high arête,¹ that joins the principal axis at a gentle swelling, about midway between Deville and the more easterly of the two culminations of the massif.

These two peaks² of Mt. Dawson are quite unlike in form, the one rising snowy to a somewhat blunted point, the other a dark mass of rock of heavy, rudely rounded outline. From the depression between them descends a broad, seemingly vertical channel several hundred feet in width, glacier-filled, and ending in a fearfully crevassed ice-fall. Below it, and almost as a continuation of this higher ice-stream, the Dawson glacier comes nearly straight down toward the Fish Creek valley, in whose bottom lies the Geikie glacier, of which, at no very remote date, the Dawson glacier was probably a tributary. This latter, however, really has its origin in a grand amphitheatre lying between Fox and Dawson, unseen but easily divined in the view from the Asulkan pass.

Nowhere does Mt. Dawson seem to offer any obviously vulnerable point of attack. This fact, combined to some extent with its remoteness, is doubtless why its conquest has never, so

¹ The greater part of this arête is hidden from Asulkan pass by Mt. Fox itself. Its southern end is in the low dome seen in Plate XX., just to the right of that mountain.

² Mr. Parker joins me in the suggestion that these two summits be known as the Häslar peak (eastern) and the Feuz peak (western), in commemoration of the first ascent of a virgin peak in the Selkirks by Swiss guides. A precedent is offered by Monte Rosa, the second in height of the Swiss Alps, whose several culminations are similarly designated.



FISH CREEK VALLEY FROM ASULKAN PASS.



THE DAWSON RANGE FROM ASULKAN PASS.

From photographs by G. and W. S. Vaux, Jr.

U. S. G. P. M.

far as we know,¹ even been attempted hitherto during the decade and more since experienced climbers began to visit this new Switzerland. Its manifest supremacy in altitude would naturally render it the most alluring of Selkirk summits, after the settlement of the seemingly unanswerable riddle of Sir Donald. Certainly it had not failed to stir the normal sentiment in bosoms worthy to cherish it, and more than one of the party of 1897, even with an attack upon Mt. Lefroy in view, deplored the stern necessity which bade them leave the Selkirks for the Rockies without at least a reconnaissance of Dawson.

But the season of 1899 furnished the requisite conditions for this attempt and for its successful issue. First and most important, the Canadian Pacific Railway — as if to force upon the apprehension of a slow-witted public the fact that their line traverses real Alps, as real as those of Switzerland itself — had imported three guides from the base of the Jungfrau, two of whom were stationed all summer long at Glacier. Next, — an almost equally important item, since guides seldom take the initiative as explorers, — it was essential that some one should appear with heart set on this special enterprise, and with time at his disposal to await the favorable conjunction of circumstances. This latter rôle it was my own good fortune to fill, and a destiny, happy for both of us, furnished at the proper time a companion in one of our Lefroy party, Mr. H. C. Parker, who tarried at Glacier while en route for Alaska.

I had come out from the East, not with the ambitious inten-

¹ Since writing the above I have gained new light upon this matter. It appears that Huber and Topham intended to ascend Dawson, but were prevented by the weather. To quote from Huber's narrative in the *Jahrbuch des Schweizer Alpenclub*, Jahrgang xxvi., page 288: "Wir trugen unser Lager nach dem Fuss des Donkin-passes hinüber, in der Absicht den Mount Dawson am 31. (August) zu besteigen. Allein am Morgen erwachten wir in kalten Wassertümpeln und rings um uns lag Schnee. . . . Gegen Mittag brachen wir auf, und gnädig liess uns das Wetter den Donkin-pass zum fünften Mal überschreiten. Die Nacht wurde am Dawson-Gletscher zugebracht. Der Morgen des 1. September war schlecht genug um uns nach Gletscherhaus zurückzutreiben." Their first camp being on the south side of Donkin pass suggests a purpose to scale the mountain from that side, and probably the western summit. A comparison with the map accompanying his narrative shows that our bivouac must have been almost at the exact location of the second camp mentioned above. In the course of his paper Huber refers (page 287) to Mt. Dawson and a near neighbor as probably the highest summits in the Selkirks thereabout, as seen by him from Mt. Purity.

tions suggested in a dispatch to the Associated Press a few weeks before, namely, to join certain well-known explorers in an attack on Mt. St. Elias from Banff as a base! My aspirations, though more numerous, were less audacious and geographically more plausible. My hopes were set on securing three virgin summits, — the highest spire of Cathedral Peak, the true summit, unseen from the railway, which far surpasses in altitude the bolder, much shattered crag that overhangs Hector pass; then the snowy dome of Mt. Vaux, with a possible descent over the gothic pinnacle of the Chancellor, which at that time I thought to be simply an outlier of that grand upthrust of igneous rock; and last, but most desired of the triad, Mt. Dawson. For the first two of these trips I had counted on securing the services of the third guide, who was stationed at Banff. When it appeared that the conditions under which he was retained there rendered such a contract impossible, surrendering with as good a grace as might be the chance of pioneer work on these two very attractive peaks, whose bases are so accessible to the railway, I hastened on to Glacier to bend all my efforts to securing, if possible, the hoped-for climax of my earlier expectations. (My somewhat extended notes of numberless studious reconnaissances of Vaux and Cathedral Peak, made at odd hours during the spring from various photographs in my possession, are at the service of any intending assailants.)

I reached Glacier on the 3d of August. I believe I may assert with no immodesty that my advent was a source of unmixed pleasure to at least two of the varied company gathered on the platform to witness the event of the evening, the arrival of "No. 1" — as the west-bound overland train is commonly designated. I refer to the two unique-looking, bronze-faced men, who, religious in the performance of their duty, paced the platform during these important half hours in hob-nailed shoes, pipe in mouth, and otherwise attired as the regulation Swiss guides. No pair of twin brothers were more nearly duplicates in raiment; no two guides ever more effectively supplemented the one the other in excellences than did Christian Hüsler and Edouard Feuz of Interlaken. Glad they were, for they were longing for more enterprising labors than these promenades, and the hardly bolder ones that constituted the chief of their functions, the



BARBACH

HÄBLER

FEUZ

PIONEER SWISS GUIDES IN THE SELKIRKS.
From photographs by C. Van Brunt and G. and W. S. Vaux, Jr.

guiding of tourists to the foot of the Illicilliwaet glacier, with the possible roping up for short trips on the ice-foot itself. Thus far during two months and more they had gotten in only two first-class trips: one an ascent of Eagle Peak, varied with a bold descent over its precipitous north face, in which some weeks before they had accompanied our corresponding member, Mr. H. G. Bryant, and Mr. L. J. Steele, an enthusiastic young English climber; the other the second ascent of Sir Donald, the narrative of which is published in this same issue of APPALACHIA.

As a practice trip, and in order to enter into proper relations with one of the guides, — to learn, that is, his ways while granting him an insight into my own qualities and defects, — I invited Häslar to accompany me on a sort of sentimental journey. It combined the completion of an undertaking abandoned for cause five years before, and the revisiting of a spot around which mixed associations hover; in short, the ascent of Eagle Peak by the southeast arête. That was the tour in which Mr. R. F. Curtis and I were absorbingly engaged in 1894, when, owing to a seeming reversal of the miracle of Joshua, we got benighted, and passed moonlit hours (that later yielded the white and azure stage to a gorgeous sunrise spectacle), on a narrow ledge several hundred feet below the summit. In a whole lustrum of visits I had never found opportunity to revisit that well and, on the whole, favorably remembered spot.¹

On this occasion our trip was a success in all respects. It proved to me that Häslar was a first-class guide; to him that my hinges and lungs were not yet worn out; to both of us that two novices, with inadequate equipment, even with unlimited daylight at their disposition, would never have attained the summit of the peak, for just beyond the point where Curtis and I had turned back it becomes necessary to pass a buttress of rock, a *felskopf*, more difficult to negotiate than anything our party later found to do on Mt. Dawson. Next in desirability to the ascent of a new peak is ranked the new ascent of an old one, especially if it be by a more difficult way, and such most decidedly is the scaling of Eagle Peak by this arête, so I gladly class it with Dawson in counting my spoil for the season

¹ See APPALACHIA, vol. vii. p. 297.

of 1899. Our descent by the ordinary route was accomplished in very rapid time in the midst of a pouring rain. This began in a tempest of hail, that drove us into a rocky shelter just below the summit, wherein we endured "the slings and arrows of outrageous fortune" as the sequel of the single thunderbolt discharged during the squall. Striking just over us, it sent small fragments of stone rattling down through a crevice above our heads, and induced a disagreeable interchange of compliments between my ear and the adjacent rock, against which the narrowness of our quarters was crowding me.

The rain-storm thus inaugurated became a leading factor in all future plans,—our inevitable "if." It began on August 5th. It was a full week later that we finally got under way for Dawson, and during most of the intervening time it simply rained as if all the traditional "flood-gates" were wide open.

Meantime there appeared on the scene not merely Mr. Parker, but also Messrs. Bryant and Steele, returning to Glacier after some days spent in reconnoitring about Mt. Assiniboine. Their principal object was to ascend Mt. Sir Donald, and they had counted on finding the guides at their disposition. Their disappointment on learning that these were preëmpted for the first fine weather was mitigated by an invitation to join Parker and myself in the attack on Mt. Dawson. This they accepted, and we all looked forward with the pleasantest anticipations to the first fair day. But never did a day seem so reluctant to arrive.

Our friends began to grow discouraged, their time being limited. At length clear skies arched the proud valley, and at high noon our party appeared on the piazza equipped for the long journey. It was our plan to start directly after an early midday meal, and spend a long afternoon in reaching, by way of the Asulkan pass, some comfortable spot for a bivouac beyond the Geikie glacier, on the lower slopes of Mt. Fox. But we got no farther than dispatching the proposed meal. While engaged in this preliminary a squall suddenly descended over the Hermit range, the rain again came down in torrents, and a new chapter of the same old story was begun. One of its unpleasantest consequences was the compulsory departure of our hoped-for companions for England and the Berlin Geographical Congress. Meanwhile Parker and I sought consolation in three daily

meals at Miss Mollison's dainty table, while I personally benumbed all capacity for impatient regrets in the endless task of analyzing the hotel register.

The 12th of August dawned brightly, and at one o'clock our diminished party finally got under way, attended by the good wishes of the guests at the hotel, who entered heartily into the spirit of our undertaking. Perhaps, therefore, our pace along the gravel walks was a little more elastic and sprightly than that into which by tacit consent we fell as soon as we had passed beyond sight of the piazza at the beginning of the forest trail. The long housing, with the attendant lack of exercise, — to say nothing of other ills, — had been no proper preparation for so toilsome an excursion. The day, moreover, was warm, and the long pull of seven miles to the top of the pass offered little to inspire one to whom the way had grown familiar. Yet, taken for the first time, it is a trip of varied interest, both the earlier miles along the valley bottom with long woodland reaches, broken by expanses of meadow with tall waving grasses, with the constantly changing glimpses of grand rampart walls and dusky dentate summits lifted high above the snows, and the perfect Lauterbrunnen of cascades, filling the air with "the rush of many waters;" and even more so after one leaves the torrent to its ravine and ascends the steep grassy slope, set like a park with shapely evergreens, that leads up on the easterly side of the glacier to the beginning of the *névé*. Different from our experience in former years, we found the trail in perfect condition, for the men engaged in putting it in order had this very day come through to the upper end, wherefore a party of our friends had taken the opportunity to enjoy their favorite trip to the Asulkan snows. We met them returning near the new shack, and were cheered by their "good speed" on our upward way. With them returned a good friend who had borne us company from the hotel and generously shared our heavy burdens.

At five o'clock we reached the pass, having found the *névé* not so much softened by the heat of the day as to prevent quite rapid progress over the easy gradient by which on this side the col is approached. The wonderful view that suddenly opened before us — and in particular the striking profundity of the

Fish Creek valley — drew expressions of admiration from the guides. "Ein schönes Thal!" broke from Häslar's sphinx-like lips, as we came to where its wild beauty could be seen more completely.

My own earlier trips in this direction had never brought me quite to this point, so that it was with great interest that I gazed over into the unfamiliar world beyond. I was struck with the remarkable contrast to the side by which we had approached, with its slowly ascending field of snow and ice reaching down behind us for perhaps two miles. Before us the snow ended after a few hundred feet of steep descent; then came a broad expanse of green "alp," beyond which the slope fell away at so steep an angle that the line of vision met the equally precipitous opposite side of the valley. The bottomless pit might, for all we could see, lie between. To our great relief, we could see that the base of the great shoulder of Mt. Fox, that divides the Geikie and the Dawson glaciers, was well timbered, a revelation which removed all our uncertainties as to finding a comfortable place for the night and an ample supply of fuel. True to their education, our guides before starting had proposed adding some firewood to their already heavy packs!

Thus reassured we began our descent, easy at first, as we glissaded after a fashion on the softened snow; not so easy on the steep grass slope, a perfect garden of alpine flowers, among which the yellow alpine lilies were lavish of their gold; a very serious task when the grade grew yet steeper. A powerful torrent from the melting snow flows, where it does not leap, down this precipitous incline, its course deeply eroded into the clayey gravel. It is a question which side of it to take in making the descent. As it was "every man for himself" with us, Feuz took the left hand and made the quickest time. The rest of us on the right side were in constant doubt whether to keep in the scrubby growth that extends from the alp down to the edge of the Geikie glacier, or to avoid its bristling tangle and imitate Feuz's celerity down the steep clay-bank. Unfortunately it ended in a yet more precipitous ledgy base, with an ugly talus to fetch up on, in case of a most easily arising slip. Our earlier attempts were quickly abandoned, but later on we gained confidence and made a direct descent to the torrent, which now —

some five hundred feet above the icy bottom of the valley — vanished, and hushed its hateful roar under a broad tongue of old winter snow that abutted on the glacier. It was steep enough for glissading, but too dirty to render this a pleasure. Traces also of the recent visit of bears were seen here and there upon its surface.

The Geikie glacier is here possibly a third of a mile in width, ascending at first but slightly to the left, but broken a few hundred yards above our crossing-place by one of the most interesting ice-falls I have ever seen. I regret that we secured no photograph of it. It remains in my memory as the beautifully battlemented vertical wall of a vast castle of ice. The surface of the glacier where we crossed it was rent with several good-sized crevasses lying athwart our way, but our guides made short work of their intricacies, and by seven o'clock we were resting on the southern moraine. Twenty minutes later we had found a fairly good camping-spot some four hundred feet higher up, and only a few hundred feet from the eastern moraine of the Dawson glacier. In the hollow between us and it ran a little stream of excellent water.

Our guides had their own opinion as to what is desirable for a bivouac. I would fain have stopped in a smooth open glade, where a soft and ample couch of level turf was assured, and with an unlimited supply of fallen tree-trunks in its outskirts. In their woodcraft, foliage overhead seemed to be the chief desideratum, and, being in a somewhat docile mood, I was lured yet higher up, into high protecting timber to be sure, but where it was difficult to find a level spot large enough to stretch one's self out. Of the two, other things being equal, I would prefer to look rather to my under than my upper side when supine. Enough dry timber was at hand to make a capital fire, and soon we were disposing of our evening meal. Mine was entirely confined to fruit, which I had stipulated should form the leading feature of the lunch put up for me. That I knew I could "worry down."

To tell the whole truth, I was completely out of condition. Besides the absence of appetite, due to the wretched régime of the preceding week, an ulcerated tooth had given me no rest during the two previous nights. From some inexplicable cause

it was allowing me a respite from pain — as it proved, for the trip only — but a general feeling of malaise rendered this a third consecutive sleepless night. I was at least saved one form of distress that has become conventional in all narratives of mountain ascents that require a night out, — that inspired by the unwelcome early summons of the guides.

For us this came at 3.15. At four o'clock we were already on the crest of the moraine that, bounding the eastern side of Dawson glacier, rises with remarkable uniformity almost in a straight line for nearly two miles. Below us, on the right, extended the dirty iron-gray expanse of this much shrunken river of ice; sometimes we must have been sixty or seventy feet above its surface. On our left, a long patch of old winter snow occupied the bottom of the trough between the base of the moraine and the beginning of the slope of Mt. Fox. This we regarded with interest, as offering a speedy line of return over the portion of the way we were now making with slow, dogged steps and without a single pause. The result of this continuous pace was apparent at the end of our first hour, when the barometer indicated that we had risen nearly 1300 feet above our camp. The monotony of the way had been broken only by the glorious pageant of sunrise. Not that we saw the sun itself, which was hidden by Mt. Fox, but beautiful rose-colored hues were reflected to us from delicate draperies and scarfs of mist, that began to weave about the giant peaks into whose immediate presence we now had come, — Mt. Donkin, the nearer nameless summit, and of the two peaks of Dawson the easterly one in particular, which, from the position we had now attained, was remarkably pointed, and was seen to end in an exquisite cornice of snow.

And now we reached a place from which we could at length look into the amphitheatre between Fox and Dawson. It was not altogether unlike the "Death-trap" between Victoria and Lefroy, though the cliffs were somewhat less sheer, and instead of a snowy incline, like that leading up to Abbot pass, the still gradually rising névé was here bounded by the base of a dark rock wall — the high arête connecting Mt. Fox with the main axis of the Dawson range.

Up to this time we had been in the dark as to how the ascent

was to be made. Would it be by the steep western arête? Should we endeavor to make it by that seemingly vertical couloir ending between the two peaks? Or would some more feasible way be revealed? The last now proved to be the true alternative. The guides declared the steep head-wall possible. Pausing, then, for only a brief rest at the end of the moraine, we took to the névé, over which we proceeded slowly for about an hour and a half, and at seven o'clock reached the foot of the head-wall at its northern corner. The altitude was 2960 feet above the camping spot we had left three hours before. Here a long halt was made for the second breakfast.

It was a strange view as we looked back over the course we had covered since our last rest. Hardly a familiar object was in sight; even those well-known from other view-points were quite transformed. The graceful rock cone of Donkin was converted into a toppling blunted snow peak. Mt. Bonney, never seen by us before save as a ponderous mural mass, seen now along the line of its axis was an exquisitely pointed spire of snow. To its left rose a magnificent peak, — a strange one to us, evidently lying north of the Illicilliwaet River, — a heavy rock-tower, flanked by two minor turrets forming one mass with it. A fine conquest is there awaiting some skillful climber.

But nearer considerations were demanding our attention, and problems evidently fully equal to our present capacity. We believed the precipitous wall at our backs practicable, but only because the guides said so. It remained to prove it. We roped up, — Feuz, Parker, Häslér, and myself, — and tackled the rocks. They tilted in the wrong direction; they were covered with wet rock-waste, finer and coarser. The leg-reaches were at times unduly long, yet hand-holds were plenty, and perhaps under ordinary circumstances it would not have seemed so hard.

But my own circumstances by this time were far from ordinary. I could see by Häslér's countenance that he was wondering if this quickly outwearied climber could be his recent companion on Eagle Peak. It was of no use to try to keep up with the procession. The procession simply had to stop, and stop often, and stop long at a time. For some of these pauses the occasion would be a darkness before my eyes and dizziness; in other cases the hitherto never experienced phenomenon of cramps in

my legs rendered the long reach impossible. I could hear the guides commenting on the situation in the patois of their canton, and venturing the prophecy that the peak of Dawson was in no danger from us that day. For a few moments I thought they might be right.

But a day is a long time when it begins at four and need not end until nine. This one was only four hours spent, and already we had covered more than half the distance, and fully half the altitude, between our camp and the summit. To be sure, we were expected back at Glacier House that night, but "circumstances alter cases." If victors, another night spent in that bivouac, even with short rations (I never wanted to eat anything again!), would be no hardship, least of all compared with returning over the Asulkan pass with joints stiffened by failure. That was not to be thought of. The top of the wall, after all, was not so very far away. So onward we moved again, and half an hour later we were on the crest, with our barometer recording 3530 feet above camp, thus giving 570 feet for the height of the wall above the *névé*.

The long rest here taken, the inspiring upward view, revealing a long stretch of our predestined course, perhaps also the laying aside of my *rucksack*, which, light as it was, had no doubt drawn somewhat on my vitality, were doubtless all factors in a remarkable change in my physical condition. So far as I can remember, from this point on there was no drawback to my enjoyment of the final steps of our victory.

The top of the connecting *arête* of Mt. Fox¹ was broad at the

¹ On consulting the few existing maps of these mountains I find them all defective either in their topography or in the application of names. The one in Rev. W. S. Green's *Among the Selkirk Glaciers* probably lays no claim to accuracy for this particular section, though he did cross the Asulkan pass and the Geikie glacier. Huber's more detailed presentation* is also quite inexact, although his various trips took him almost entirely around Mt. Dawson. He represents Mt. Deville on his map at the point of junction of the *arête* from Mt. Fox with the main ridge, bringing it so near to his Dawson as to lead one to fancy for a moment that the name "Deville" is given by him to the peak we ascended (Häslar), and the name "Dawson" to the companion summit (Feuz). In point of fact Deville lies approximately a mile farther east, where his map suggests a descending ridge. A glance, however, at his beautiful view of the ice-fall of the Grand glacier (opposite to page 289), shows that he gives the name "Deville" to the proper summit, while

* *Jahrbuch des Schweizer Alpenclub.*

point where we had reached it, but as it rose towards the principal ridge of the Dawson range, — forming as it did so a portion of the chief watershed of the Selkirks, — it grew very narrow, indeed was a sort of chisel edge. On our right it fell away in a sharp slope of slippery shaly rock, most like a slate roof on a large scale. We could not see its eaves, but we well knew how far a sheer wall fell beneath them before reaching its foundation under the *névé* of the amphitheatre. On the left the fall was nothing so great, yet precipitous, when not almost equally impracticable by the presence of heavy masses of snow. Evidently the recent storm had here been partly snow, most of which had been melted on the westerly exposures by the heat of the day before. We made our way along the very edge in the order before mentioned, the lighter and younger guide in the lead. In one place the slipping of his hob-nails on the tilted strata, involving a reluctant descent for a yard or two, led to an increased attention to the slack of the rope that united us. In another spot it became necessary to abandon the rock and take to the snow on our left for a short distance. This we did not particularly care to do, as it was an uncertain reliance, and there was snow work enough awaiting us, for just above us the rock exposure disappeared under the massy covering of the upper *névé*. This junction, at nine hundred feet above our last rest, we reached at 9.25.

Meanwhile a change for the worse had been taking place in the weather. Those rosy sunrise mists had been more beautiful than promising. The barometric conditions were against us, yet not too hostile. The vapors condensed no farther than to wrap us in cloud for a while, save that fine snowflakes were sifted over us from time to time.

From here we were to bear away to the right, directly for the

the sketch from his photograph on the *arête* of Sir Donald (page 277) shows the title Mt. Dawson over our Häler Peak. The picture opposite to page 280 shows, to the left of Deville, the low summit in which our *arête* ends, and the high snow-field over which we passed before reaching the foot of the final peak.

Mr. W. S. Vaux, Jr.'s map (1898) perpetuates some of these inaccuracies. Here also Mt. Deville is the end of the grat from Mt. Fox, but his hachures suggest a peak farther east, which is the real Deville. The "Mt. Dawson" of this map would be the minor summit east of Donkin pass. The true position of the Häler Peak of Dawson would be just to the right of and below the lettering of the name.

eastern peak, and this we did, though losing sight immediately of our goal in the dense fog. From now on Häslar and Feuz exchanged places, the elder man being the more expert of the two in snow work. And it was most interesting to watch the sure instinct with which he led us on, guided apparently only by the gradient, and, when suddenly an ugly schrund yawned before him in the mist, how unerringly he chose the right direction in order to flank it with the least waste of time. As if this had been the final test of the general worthiness of the party to attain success, the sun again came forth, revealing a dazzling expanse of unbroken snow extending up at an angle of perhaps 30° to the base of the final peak. Over this we moved with steady pace, pausing for occasional breathing spells.

The final chapter was varied and interesting. The grades now became very steep, from 45° to 60° , between where we now stood and where the névé ended at its junction with the rocks of the summit arête. At the base yawned the great schrund which is plainly visible from the Asulkan pass, forcing us some distance to the right in order to pass it by a snow bridge. Returning then on our course, we made our way in soft snow above its upper lip, taking care not to start a slide. This was the most critical part of our ascent, this and the transfer to the rocks above from the thinner layer of yet more softened snow, where it laps upon them. This task accomplished, the long toil was over. There remained only the exhilarating sport of passing along the edge of this sky-cleaving wedge, now upon rock, anon crossing some deep nick on a sharp arête of snow, until at length, at 10.45, we stood on the topmost summit.

What with the enjoyment of the remarkable spectacle and the various employments the situation laid upon us, the hour we spent there passed only too quickly. Upon the narrow edge of broken rock, hardly more than a yard in width, beyond which a broad cornice of snow hung far out over the abyss, the guides built a stone man, in a cavity of which, in default of an Appalachian cylinder, we deposited an empty pickle jar containing a card with the principal data of our ascent. Parker, after careful readings of his aneroid, devoted his attention to his camera. I sought occasions to use the pocket level. The mists, which now were forming and parting all about us, inter-

fered to a great extent with both these occupations, yet compensated for the annoyance by the marvelous beauty of the cloud pictures with deep vistas through them, ending upon nameless peaks and glaciers. One interesting reading of our level was to the summit of Mt. Bonney, distinctly lower than our own altitude. As Bonney is almost identical in height with Sir Donald and Rogers Peak, this showed that we had reached the highest altitude yet attained among the Selkirks. The corrected reading of the aneroid bore similar testimony, crediting us with 10,800 feet. No other of the wilderness of peaks, seen more or less clearly in momentary glimpses, appeared to attain our level. To our great satisfaction the companion peak, possibly a third of a mile distant, proved to be lower than that on which we stood, though it is doubtful if there was a difference of ten feet in our favor.

If the atmospheric conditions robbed us of the magnificent panorama we may have counted on, the loss is attended by one great advantage, in that it relieves me from the naturally expected duty of describing the indescribable. I need only add to what I have already said that our clearest views were southward, where rose Mt. Purity and the other peaks visited by Huber and Topham in 1890. Presenting to us their snowy northern sides sweeping down to the vast névés from which they spring, the prospect was wonderfully alpine in character.

The guides were naturally much gratified with this almost despaired-of success. As they lighted up their pipes, resting from their labors, we propounded a few questions: "How does this compare in difficulty with your ascent of Sir Donald?" "It is twice as hard." "How with the Matterhorn?" "Harder." "What climb in the Alps is most like it?" "The Wetterhorn."

At 11.45 we began our descent. In returning we followed almost in the footsteps by which we had come, even down the steep rock wall descending to the amphitheatre. On reaching the moraine, however, we kept it only to the beginning of the snow patch on its right. Descending to it, we speeded on with many a sprint and abortive glissade, and at three o'clock camp was reached — and the enterprise accomplished?

All but getting back to the hotel, still nine or ten miles

away, beyond that steep ascent which rose like a wall across the Geikie glacier. Yet no one suggested a delay until the morrow. Taking a half hour to pack up our traps, we set out at 3.30 on the home stretch. Shortly after leaving the summit the sky had cleared to some extent, and bright sunlight had attended us nearly all the way back to camp. But now the clouds gathered again in real earnest, and by the time we were across the glacier large drops were falling, and anon a drizzling rain had set in. Doggedly, under their still heavy packs, the guides made their slow way up through the dripping scrub and over the slippery clay, we right at their heels. Little was to be seen, but in our ears was the incessant roar of cataracts rushing down the precipitous slopes on either side of the contracted valley. At times the volume of sound would increase menacingly, as the wind would waft it towards us. Until we came out upon the grassy alp there was no cessation of the dismal shower.

Here it desisted, and through the clearer air we saw a sight novel to all of us. In an open space on the opposite side of the torrent from ourselves, and perhaps three quarters of a mile distant, was a large animal apparently browsing. We might easily, in a civilized region, have taken it for some solitary cow in an upland pasture. In color it was a dingy white. We shouted, but the roar of the torrent prevented our being heard. For five or ten minutes it scarcely stirred. As we started on through the open it doubtless got sight of us, for it moved away at a gradually accelerating pace, and soon was lost to view. We decided that we had seen some patriarch among mountain goats.

At 6.30 we stood in the pass, but the changed gradient was our only evidence, as we were now enveloped in the densest fog. That this proved no obstacle to our progress is proven by the fact that twenty minutes later we had reached the shack, well down towards the base of the park-like slope. At 7.30 we were at the beginning of the trail, and at 8.45 were receiving the cordial congratulations of our friends at the Glacier House. We had accomplished in a day and a half what should properly have taken the better part of three days, and had concluded our forced march by covering the last seven miles of *névé*, grass-slope, and sinuous trail in just two hours of walking—and running.

The Resort to Glacier House, British Columbia.

BY CHARLES E. FAY.

THE Glacier House is situated upon a world-thoroughfare. Hundreds of those who annually tarry here are *en route* between Europe and Eastern Asia, or completing tours of the globe. A most varied array of place-names appears upon its register. On the opening days of a recent season one would have suspected that a geographical congress was in session with Asiatic delegates most in evidence. Yet the cognomens to which these Oriental hailing-places are attached are chiefly European, their bearers being self-exiled residents in distant lands in transit to or from "the old country."

Only a small fraction of even the first-class passengers of the Canadian Pacific Railway are recorded here, for the booking of those who merely take the customary meal during the half-hour's tarry of the overland trains is not desired; merely those who pass at least a day are expected to register. Furthermore, as the hotel proper is closed during the winter, excepting in so far as its dining-room service is concerned, the registration is principally confined to the period between May and October. It would require more than a close inspection of the dates to bring out the interesting fact that some of these guests from the Atlantic States now come in parties for long summer sojourns.

My curiosity had been excited on previous visits as to what a classification of guests by hailing-places would show. Finding myself weather-bound during the extraordinarily wet season of 1899, I determined to make such an analysis my pastime. The extended leisure of eight rainy days proved none too much time for a task which, under ordinary circumstances, would have been inexpressibly tedious. But pitting my obstinacy against that of the bad weather, the self-imposed task was completed and the 12,000 names duly packeted. Since the results may prove interesting to others, they are here published.

THE REGISTRATION OF GUESTS AT GLACIER HOUSE, BRITISH COLUMBIA, SINCE 1887.

[BRACKETED NUMBERS NOT TO BE COUNTED FOR TOTALS.]

	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	Total.	Gd. Total.	Aver.
CANADA	396	490	490	274	342	297	238	201	182	236	252	166	3564	3564	297
UNITED STATES..														5264	438
New England..	22	63	62	132	94	131	97	72	63	34	85	40	895		75
Boston	[8]	[38]	[43]	[90]	[37]	[84]	[66]	[32]	[37]	[21]	[57]	[27]	[833]		[44]
Middle States..	35	132	148	215	179	204	241	142	136	112	187	139	1870		156
<i>New York City</i>	[22]	[81]	[90]	[100]	[82]	[74]	[93]	[80]	[89]	[72]	[90]	[61]	[904]		[76]
<i>Philadelphia</i> ..	[7]	[4]	[13]	[70]	[33]	[65]	[73]	[28]	[33]	[11]	[37]	[60]	[414]		[36]
Central States..	54	70	139	124	152	192	71	126	122	128	198	105	1481		123
<i>Chicago</i>	[12]	[11]	[19]	[28]	[28]	[43]	[26]	[30]	[28]	[48]	[48]	[25]	[346]		[29]
Southern States.	2	3	8	12	9	28	4	4	2	3	23	6	104		9
Pacific States. .	34	74	82	120	145	74	106	61	82	49	46	41	914		76
WEST INDIES.....			1				3	2		1	1	1	3	3	
SOUTH AMERICA..													6	6	
EUROPE.....													2215	2215	185
England.....	81	122	121	129	240	173	155	116	87	122	278	157	1781		148
Scotland.....	11	10	15	15	22	27	16	15	18	6	33	17	205		17
Ireland.....	3	4	4	2	4	7	3	2	6	4	7	1	47		4
Wales.....	1						3				7		11	.	
France.....	7	5		3	4		16	2	3	4	7	1	52		4
Belgium.....					3		4		2				9		

A few words of comment are necessary. No such tables can be perfectly accurate. Some 276 entries are here classed as "doubtful," chiefly owing to the inability to decide whether the place was in one country or another. Thus "London" might seem to locate an Englishman, but some other guest would write out in full "London, Ontario." Sometimes the national characteristics of the handwriting would be allowed to decide. Doubtless no serious error would be made if this list were equally divided between England and Canada.

Canada is, however, already credited with too many names, owing to the fact that in the earlier years the local railway-officials were accustomed to register in their frequent visits; and although their names were later omitted from the count, time did not allow the revision that would have removed them from the record of those earlier years. Possibly the one inaccuracy offsets the other, so that the number of Canadian guests may be regarded as approximately correct. Naturally a large per cent. of these are from the western provinces of the Dominion.

The showing for certain of the large cities of the United States is quite suggestive. In all these cases the "larger" city is taken, the city and its field of near influence: thus, "Boston" includes Salem, and "New York" not merely Brooklyn, but such places as Newark.

Of the 12,000 guests, it appears that 5264, or 44 per cent., are from the United States. Of these 4246, or 82 per cent., are from regions east of, but including, Minneapolis, and north of the Ohio River; while 2765, or 52 per cent. of all coming from this side of the international boundary, are from New England and the Middle Atlantic States. The "Central States" extend to the Rocky Mountains. The "Pacific States" include everything beyond the Great Divide.

The totals for 1890, 1891, and 1892 are raised considerably above the average by the registration of large "personally conducted" excursion parties, sometimes nearly one hundred in number. The members of these parties were principally from the United States. The Queen's Jubilee accounts for the very large registration from Great Britain in 1897. Christian Endeavorers returning from San Francisco also contributed to the large total for that year.

An Early Ascent of Katahdin.¹

BY EDWARD EVERETT HALE.

IN the summer of 1841, with my classmate and near friend, William Francis Channing, I took my first lessons in mountaineering and in woodland life. Our experiences of that summer were so pleasant that I welcomed an invitation from him in the summer of 1845 to join him in the ascent of Mt. Katahdin. At Mt. Washington we had worked our own way in ascending, but we had returned by what we used to call "Fabyan's Path," which was then comparatively new. With Katahdin, however, we knew that we should be on a mountain without trails, excepting as the lumbermen might have opened roads for their purposes in some of the lower regions. We proposed after the Katahdin enterprise to see as much of Moosehead Lake as our time and money would permit.

We went to Bangor from Boston by steamboat, and thence by some regular stage route to Mattawamkeag. This was then simply an active frontier village from which "the Government road," as it was called, struck off through the woods to Houlton, our frontier post on the north. Mattawamkeag was so entirely a frontier place that the first day we were there a deer entered the village, ran through the town, and tried to escape by swimming the east branch of the Penobscot; but I need hardly say that before the poor creature got across he was murdered,—boys and men appeared with shot-guns, and the chance was badly against him.² He had the law on his side, for this was in August. The people whom we saw generally condemned the shooting, but it was evident that "public opinion" was against him. I suppose a jury would have found that he was "killed in self-defence."

¹ The usual spelling in APPALACHIA is Ktaadn. — ED.

² On comparing this preamble with the letter which I sent to the Daily Advertiser fifty-six years ago, I am glad to see that I also have been somewhat borne forward by the great tide of the world's evolution in morals, which is always flowing, and on which I and this reader have been floating to this hour. Whoever will read the letter which follows will see that the youngster of 1845 was willing to breakfast on the murdered deer of the Mattawamkeag River. What is certain in 1901 is that the same youngster after fifty-six years would spurn such a meal with horror, as he hopes this reader would do.

I mention this incident, writing in 1901, because I do not believe that a deer would be killed now which should appear in any village in Maine in August.

We engaged for a guide in Mattawamkeag a very intelligent and interesting man, whom I have held to be a friend to this moment, although for many years I have not heard from him. I say this rather in the hope that it may meet his eye in APPALACHIA, and that he will be good enough to write to me. He was a lumberman from Lincoln, a little below Mattawamkeag, and belonged to a party which had been at work on the upper waters of the East Penobscot.

He undertook to take us up the mountain on the north side, which we had preferred. Most explorers then and now have been, and are, more apt to attack it by the slides on the southern side from Lake Millinocket. Our preparations were simple, for the expedition would not last, as this reader will see if he perseveres, more than four or five days. I learned for the first time how to pack my traps in a blanket and to discard the knapsack, which I suppose has its advantages in a long campaign, but is rather a conventional encumbrance, if the tramp does not last long. I think that our associate, Mr. Quincy Shaw, may be amused by the story of a remark which in its time did me some good. We had gone four or five miles into the woods, fishing, I believe, and fell in with one of the people of the land. He asked me where we came from. Did we come from the West? I said we did, that we came from Boston. What interested me was, to see that though he had heard of Boston, this was not as the capital of New England, or as the centre of the lumber business of America, or as the birthplace of public education, or for any other of the historical reasons mentioned in the geography. I doubt if he cared anything about any of these; he answered simply that he knew Boston: "It was where Quincy Shaw came from." Mr. Shaw had then graduated from college two years. It was not yet the time for "Calumet and Hecla," but he had already won in these Maine woods his reputation as a good woodsman. On the eastern Penobscot, Boston owed its reputation to him.

I had told Dr. Asa Gray that I was going to Mt. Katahdin, and he had told me that no one had ever brought plants from

its alpine summit. He said that summit was more than one hundred and fifty miles distant from the summit of Mt. Washington, and that it would be interesting to see if there were the same flora on two little alpine patches as far apart as those on these two summits. I said eagerly that I should be glad to bring him any plants that were new to me, and he told me how he wished me to preserve them. But he said very decidedly that I need not bring him any of any species or variety, unless I could bring him twenty specimens. He should need as many as these for his correspondents, if by good fortune I stumbled on anything new. I hope I need not say that I was eager to serve him whatever the conditions, and this involved my providing myself with large sheets of what we then called "binder's board" for pressing my plants. In point of fact, I brought down with me more than four hundred different specimens in different stages of drying. This means that I had twenty or more specimens of each of twenty alpine species or varieties. As it proved, these are all identical with species or varieties on the summit of Mt. Washington, for nothing has been found on Katahdin which is not on Mt. Washington, though there are, I believe, alpine species on Mt. Washington which are not on Katahdin. The summit of Katahdin is some nine hundred feet lower than the summit of Washington. The comparison of these two floras makes a very pretty illustration of Dr. Gray's admirable statements, published when he was president of the American Association, as to the distribution of plants in the northern hemisphere.

The narrative which follows was written at the time and printed in my father's newspaper, the Boston Daily Advertiser, on August 15, 1845.

* * * * *

We got back to Mattawamkeag before dark. . . . Just after tea and sunset we had walked down to the bridge with "Uncle Barton," a venerable boatman known to the whole town, and were talking with him, when he started wild with excitement, and pointed out the antlered head of a deer swimming the stream right towards us. The announcement at once called down the whole tribe of tavern loafers, and after a most exciting water chase of half an hour, the poor deer, kept from landing by people on either side the stream, was overtaken

by a boat and killed. There was a perfect wildness, not to say madness, in the excitement of the whole scene, in which I entirely partook. It was quite dark when the *coup de grâce* was given, but the excitement of the whole pursuit on water and land was infinitely intense to the last. He proved to be a two or three year old, not in the best season, but not to be rejected; and I ate a piece of him the next morning.

It was suggested to us that evening, that if we wished to ascend Katahdin, two days in a bateau would carry us thither, with a good stopping-place at Foster's, and a day or two bring us back. This would involve but one, or perhaps two "camps," and with our taste of woodland life, our growing enthusiasm for the mountain and all the scenery, and the pleasantness of the sail, we at first determined to undertake it. But fortunately, as the weather proved, a difficulty interposed and eventually prevented. Two boatmen were necessary to pole or *kent* the bateau up the streams and through the lakes to the Sourdnhunk on the west side of the mountain. "Uncle Barton," himself ready to go, declared it impossible to find another.

The reason was, that the rivers were rising from the protracted rains, and owners of lumber cut last winter were drumming up all the men they could as "drivers," — to go out upon the masses of lumber which had jammed up at falls and rapids, and *run* it or *drive* it down. The timber in one of these jams, some twenty miles off, was estimated at thirteen million feet, and was piled up twenty, thirty, and forty feet above the water. It is necessary to wait for the river to rise, and then go out on the logs and poke and drive them off from their sticking places, till the force of the current shall send them down.

You may conceive what a venturesome business it is. Just on the day on which we were at Mattawamkeag the rivers were rising, and the house was filled with "drivers" on their way up to the jams. I talked with a good many of these, and found one, who had been up to Sourdnhunk, and upon our mountain.

He expressed great interest in the expedition we proposed, and a desire to go if his employer, Mr. Hall, would let him off from his engagement on his drive. So I went to Mr. Hall, whom I found a very prepossessing, intelligent gentleman, who could not, however, on any account, spare this boatman or any of his hands, and we gave the scheme up. I have told the story at length, because for poor Hall and the man, the *if* proved, as I was shocked to learn on my return, an awful one.

They went off the next morning, all the timber was well got down, but just as the drive closed, by an accident caused by this very boat-

man, the boat was swamped under the great falls, and he and Hall and two other men were drowned. Our expedition could not by possibility have involved such danger.

It was suggested to us at this time, that Katahdin would be easily reached by land if we chose to return to Mattawamkeag the same way, and we resolved at all events to go on the excursion from which we have now returned. You will see that we made a descending climax in the arrangements of civilization till we got to the end of it, and perhaps a little further ; but never beyond hail of it.

Our new plan was to ascend the mountain on the northeastern side, where it rises most gradually, and where, consequently, your ascending grade may be improved, though at a sacrifice, by increasing the distance. We were fortunate enough to meet with an excellent guide, perfectly familiar with the country on the Wassataquoik River, through which we should pass. He had ascended the mountain two or three times himself with sundry of his workmen, was a thorough woodman, boatman, campaigner, lumberman, and withal an intelligent and agreeable companion.

This preliminary settled, — without the necessity of looking for a proper guide on the way, we started Saturday morning in a wagon, on the Fish River road, — still woods, woods, woods. The little town of Benedicta, owned by Bishop Fenwick, and settled by him with Catholics, was for many miles the only clearing. A great many of the houses there have perfectly the appearance of old Ireland. Those which have not, had unfortunately lost all their window glass just before we passed, by a vehement hailstorm. The town looks thriving ; has a good soil, and commands several noble distant views, which, however, we could not enjoy then, for we passed it just after the most tremendous shower of rain that I ever knew. We arrived at Robinson's Inn, which is in No. 3 in the Fifth, with good appetites for a good dinner. Still civilization. Framed prints from the New York Mirror round the wall, and a Greenleaf's Map of the latest edition.

From this place we were to "travel" the rest of our way, *Anglice* to walk. And here, therefore, we made our preparations for four or five days' absence, by making up our packages for the expedition of what things seemed necessary. With these, at five we started by a logging road, or wood road, or winter road, — exactly such a road as, when one passes in driving, he wishes to be on horseback to enter. All the trees are cleared out from it, but the lowest undergrowth left. The streams are roughly bridged, and the worst morasses, but it is intended that four or five feet of snow and hard frosts shall give to it its final superstructure. If much travelled, however, it is in dry

weather a very pleasant walking road, though, as it is not at all graded, quite unfit for wagons. By such roads we went through to Katahdin.

Hunt's Inn is in No. 3, in Seventh Range, on the river Penobscot. We found we should not reach it that night easily, and so sought and obtained most hospitable accommodations at the house of a settler in the township East. I wish I could give you any idea of the kind, frank cordiality of the whole family.¹ Six or eight boys and girls, who with their father and mother lived in one log cabin, never got in each other's way, but all welcomed and assisted, and seemed cheerful; and the geniality and intelligence and refinement of the whole circle put us quite in love with log-cabin life.

We slept there, and at 5.30 the next morning walked to Hunt's to breakfast, through a drizzling shower and miserably wet roads. The position of Hunt's farm, the only one in the township but his son's, is for picturesque beauty utterly unsurpassable. From a thick forest you came out upon a hillside to his clearing, grass and grain covered, sweeping down the hill to the river. The river here takes a long circuit, enclosing on the opposite side a noble piece of intervale covered with the richest growth of hardwood timber, whose varying and brilliant shades contrast with the more sombre evergreen growth of two or three fine mountains which rise immediately beyond. Hunt's house is just on the river opposite this forest peninsula. It is a large, rambling place, partly built of logs and partly of frame; holds communication with the settlements by the river and the road which we passed, and is the last inhabited station of the loggers in this quarter. We remained here most of the day, our guide not arriving until quite late.

About two, however, we started on our journey up Wassataquoik River. By the road on the bank of that stream we were twenty miles from the foot of the mountain. Hunt's boatman took us up Penobscot half a mile and set us on the north side of Wassataquoik, and we began to "travel."

The walk was beautiful. After a few miles we constantly followed the river side, — a stream as wide as Charles River is at Newton railroad bridge, but more rapid. The rather unfortunate evergreen growths which we have in Massachusetts, and the occasional distressed firs or spruces which you see in front yards, as ornamental trees, give you no idea of the constantly changing brilliancy of these forests. I have called the color sombre, — I believe, solemn is rather the word, and that more from its firmness of look, belonging to trees which dance and vacillate less than others, than because it has any darkness or dinginess of shade. The ground is a mass of moss interspersed with

¹ Their name was Lowell.

flowers which our woods know not, — Dalibarda, half strawberry and half anemone in its blossom; beautiful fragrant *Linnæa* in all its profusion, oxalis as abundant as possible, as beautiful as the Cape oxalises, but much more delicate, are at every step; and orchises, gerardias, lilies, *et id genus omne*, just often enough to keep you excited.

But the road itself, here and all the way, was very, very bad indeed, as thus. As I have told you, the streams were up, and by consequence the bridges were down, so that nine times out of ten, when any mountain brook came babbling or splashing down to the river, it had sent before it the logs which once spanned it, and left the traveller to span it as he could. This, if he were fortunate, he did by a tree lying across; perhaps half the streams are provided with this accessory provisional viaduct, and great skill I attained in the funambulatory art by running across with wet feet upon pines which offered this hospitality; perhaps he hopped from rock to stump, from stump to log, and from log to land, but too often, alas, like cousin Sally Dilliard's friend and companion, he waded. I suppose we crossed fifty or more considerable brooks in one or another of these ways going up, and again rather fuller when we returned.

The first day we advanced about half the way from Hunt's, and about six o'clock came to Reed's camp, where we spent the night. For a logging party in winter, there is always built what is called a "camp," which is a log cabin with one or no windows, an immense chimney and place for fire, and a tight roof that sleeping may be undisturbed.

This of Reed's was built some years since; a larger one near accommodates cattle when there are any, and the place is an established caravanserai-khan for anybody who passes that way. Nobody lives there, but the house is always ready for travellers for all that; the laws of the woods being that any one uses any camp he can find, and if he need, such provisions as may be there. I ought to have told you that at Hunt's we had made up our packs for the march and had them with us.

We had ample provision of bread, but relied for pork on that to be had at the several camps on the way. Jackins initiated us into the mysteries of cooking pork by toasting-forks on the immense fire which he built, and we made a hearty supper. Pork, you must understand, is the backwoodsman's everything. It cures him when he is sick, and refreshes him when he is well; he eats it in the morning, at noon, and at night, and looks to it as the necessary of his woodland life. If you complain of the mosquitoes, you are coolly told that a little pork well rubbed over the face will quite drive them away. By the way, unless

you be a saint, you probably will complain of mosquitoes. A single hand will show seventy or eighty incisions at nightfall, how many soever you may have slaughtered through the day.¹

The black flies, however, are the greatest torment of the region. I cannot speak from experience of them, however. The rain or the season or some other good fortune wholly exempted us from them. We spread our blankets on well dried piles of hemlock boughs and slept enthusiastically.

In the afternoon of the next day it cleared off, our guide roused us, and we walked four miles farther up the river to another camp before supper. Here we had better sleeping accommodations than the night before, another hard rain at night, for which we did not care, a promise, which was kept, of good weather for the morning; and hardly regretting the day we had lost, we started for Katahdin. Still, for seven miles further we followed the river's bank.

And it surprised me to think that here was such natural scenery utterly unheard of among the picturesque-hunters. There are two cataracts here, or series of cataracts, "the Hulling Mill" and "the Grand Falls," reminding me somewhat of Trenton. At "the Grand Falls," which are most picturesque waterfalls, the whole river is squeezed between precipitous rocks twenty, thirty, and forty feet high, so that in places it is not more than thirty, and nowhere more than a hundred and fifty feet wide, falling in sudden cascades or long rapids, for half a mile or more, in some very deep pitches, and everywhere whirling and driving and foaming grandly. The other falls are of a deeper plunge, but wider and of a single leap. The rise of the river, caused by the rains, improved all these, of course; and our guide's heart was gladdened by our seeing several of his logs, valuable property, as you may suppose, bobbing wildly down on their hasty journey to the Bangor boom. With some stoppages at these falls, three or four hours brought us to Mr. Jackins's camp, in 4 in the Ninth, just at the foot of the mountain. Here he had left in the spring considerable supplies of pork, tea, molasses, and flour. Three weeks before he had used from them there. Imagine our surprise and dismay to find that the bears had torn off part of the roof, had attacked the barrels, had carried off everything edible! A paper of ginger they had left, probably sneezing, and everything else was devastate. I don't know when anything has struck me more ludicrously.

Reduced as we were by the depredation to an involuntary bread diet

¹ After fifty-six years I like to put on record the physiological fact, that I was then and there inoculated by the mosquito so that he has not troubled me since, except by his song.

for the next two days, there was something richly absurd in the manner of the loss; and I believe we all laughed as much as we cried. The bears had been our sworn enemies throughout. They have a passion for raspberries and blueberries, and everywhere had stripped the bushes before our arrival. And now they had our meat and our flour as well as our fruit.

The stream was two feet above its level, so that the trout refused to rise to the delicate lines which for a couple of minutes we bobbed for them. We had no time to lose in fishing or regretting, and having dined, solacing ourselves with the reflection that it was not for the last time that we should be so abstemious, we reduced our packs to the smallest, took up again the line of march, and were off for the top of the mountain about noon. . . .

We had yet two miles of road; for to Jackins's camp, as the centre, Jackins's men had hauled logs in different directions, and one of these directions was well up the mountain-side. Beyond we were to ascend as we could through the forest. First, in a bateau, we crossed the river. Soon, as we went on, we came to Katahdin brook, a fine stream, rising in the mountain. It was, I suppose, forty feet across and neck deep; it had carried off bridges, and even the pine tree which once lay supplementary.

The guide took little time for counsel, but at once attacked a high pine standing on the side where we were, felled it directly across the stream, and our bridge was made. He was not more than six minutes in cutting it, if so much, and yet it was large enough to make an excellent bridge. I counted the rings and found that it was one hundred and thirty-seven years old. A hundred and thirty-seven years to keep three of us foot-dry! The woodmen have a great deal of pride in aiming trees so as to fall accurately. They put an object on the ground and try to cover it with the falling trunk, literally felling trees at a mark.

From this place to the top the ascent was steep and hard, though not till the last thousand feet, which was of low scrub growth, closely matted, was it of any very great difficulty. The woodland was very rich, and the moss under foot a perfect cushion. For about a thousand feet of perpendicular ascent we took the course of a raving mountain stream, which falls almost from the summit of the mountain. Such cascades! In one place three followed each other directly, two of them not less than forty feet, while, as we sat at the foot of the third, we could look down, down into a chasm where the stream ran a hundred feet below. This, with the boldest rocks on both sides, and the stream, which was no trifling one, whipped into a perfect

purity of foam. We left this, however, for darker woods, and through them up into this scrub evergreen, which is terribly "impassable;" but we struggled on, and on, and on, till the guide brought us to a resting-place on a bluff rock, and we turned eastward for our first view.

It was very grand. The whole country was level compared with Katahdin; and the eye stretched over an ocean of this unbroken forest, lighted up by a fine sunlight, with cloud shadows here and there varying it. Sometimes a fine lake; in a few places high mountains, over which we looked as if nothings; lines of rivers, stretching far down to the sea, which we could almost see, and, excepting the line of Aroostook road, almost at our feet, everything as wild and grand as the day God made it. It was very strange and very grand; more like the ocean than most mountain views, for there was this eternity of forest. But then the ocean, with so very distant an horizon! and just interruption enough of stream and hill to show how distant that horizon was! I cannot tell how far we saw. It seemed as if we saw everything.

The rest of the way seemed light, and we were soon walking on the tops of the little scrubs, and then soon on bare rocks. We had carefully watched the signs of the weather before we started, to be sure that it would be a fine afternoon and night, and we were not disappointed. The sun set clear. We were on the eastern ridge of the mountain, so that we could not see the last dip; but the array of gorgeous clouds and the reddened mellow light on this prospect, of which I have spoken, were as fine and indescribable as are all sunsets.

We had to look around quickly for our night's quarters, and soon pitched on the edge of the scrub wood, on the southern side of the ridge.

A barrier of the interlaced evergreens sheltered us well from the wind; a little spring of water furnished our teakettle; our packs produced their loaves; and having had tea, and I having fixed my day's plants, with an immense fire built up, we lay warmly and snugly covered in with our blankets, as near the bright stars above us as one can well be in Yankee land. I was up two or three times to replenish the fire, but, excepting these, slept as soundly as the Seven. And the end of the night was more glorious than the beginning: Sunrise. Beyond, far beyond all this eastern prospect, these lines of forest which seemed to stretch out forever,—up he came with a host of bright golden clouds round him, tinging and glorifying each individual tree of the whole forest landscape, and expanding wider yet the scene of that half horizon. Hill beyond hill, not in ranges, but scattered separately, and

the varying colors of the forest, as the golden mist lay more or less heavily upon them, or the morning clouds were more or less spirited in awaking and arising, and silver streams and lakes broke up all monotony, and made us feel at once the marvellous extent. And yet the whole country was comparatively so plain, and the forest so thick, that your eye was not fretted by the effort to distinguish separate objects, but wandered over the whole. And the whole, so unbroken and so immense, impressed you more than it could have done had it been more diversified.

And then, when you fully felt this immensity, the sun and his glorious company of clouds came up so far, so very far, beyond the farthest, — showing ranges of woodland and mountain beyond what had seemed the most distant, and yet himself so much more distant still, that the whole horizon widened most strangely before you. We had run up on a bald peak to see the whole.

And the mountain is so steep, that here where were no trees or bushes near one, nor anything in front to intercept at all the distant view, it was all the more impressive. Nothing could be more sublime.

And — there drops the curtain on our glories of the view from Katahdin. We returned to our camp with the satisfaction of a fine day before us for the ascent of the main peak. But almost immediately a cloud rolled up from the valley, and then another, and then another, and then the rain. We were at the foot of the East Peak. The Southwest Peak is a hundred and fifty or more feet higher; and we resolved to ascend that. It was two or three miles from where we slept, along the ridge of the mountain crest.

Hoping it would clear before noon, we started thither, well wrapped in our blankets, picking alpine plants everywhere, and hopping and jumping as best we could over the loosely piled rocks of the ridge. But there was no *clear-up* for us. The clouds were thicker and thicker, and the rain worse and worse, and then a hailstorm, and for an hour such a gust of wind as not the head of Winter Street in mid-winter is a summer's breath to. We sheltered ourselves at times and pressed on at times, for we were in no haste, but when we had fairly reached the little valley which separates the peak from the ridge, the storm held its own so desperately, that it was clearly useless to go farther, and back we went to our camp. Some of the precipices, where you could look down into nothing but this rolling fog straight below you, were all the more grand for it; but we sighed for the western view with its world of lakes and streams which the storm had lost us. We ascended the East Peak on our return, but could not see

at that time a hundred feet. When we came close to the nooks where our packs were sheltered, we only found them by the range of monuments which we had built as indicators.

If you can imagine three men, tightly wrapped in blanket cloaks, with caps bound closely down, strolling along over a bald mountain ridge with a wind like a mill stream knocking them backwards as it chose, and tumbling them and theirs among the rocks, I hope you will do it. There was something ghastly in the sight, for a very slight distance in the fog gave a hazy, indistinct outline to the gracefully flowing drapery,—though the horizontal lines of hail gave evidence enough of the nature of the enemy which we were pressing against so desperately. One was reminded at once of Tiffany's fine drawing of the involuntary race of the *violenti* in Dante's Inferno.

I suppose the wind was of something the same character. For the Indian tradition runs thus : that Pomola, the guardian of the mountain, lives in state on this Southwest Peak ; that no man can see him who is not perfectly pure, and that whoever attempts it finds that Pomola knows how to defend himself from intrusion. I am manly enough to tell you the legend, though we had had more confidence than the Indians, who, conscious of their imperfections, never ascended. The Sir Galahad is yet to be found who shall see Pomola. Dr. Jackson, when he ascended seven years since, met a snowstorm which the god whirled in his face. He was not more successful than we were.

Pomola keeps ten thousand white sheep, who are often seen pasturing round the mountain top, and a team of blue and gray and white horses whom he drives everywhere.

By the raked-up embers of our fire we ate our bread dinner and began the descent ; Jackins in the fog lost his course, and we went down by a longer and more unpleasant route than we went up. When we had gone down a thousand feet or more, Pomola repented ; the sun came out and the weather was tolerably good ; we got down to Jackson's camp about sunset. We found there a crew of men whom his partner had sent up to drive down the lumber. Though it cramped our quarters this gave us stores, and, fagged out as we were, it was a perfect satisfaction to find the fire lighted, the pork frying, and the tea-kettle steaming. The camp was a small one, but we stowed in, and we who had the best places slept very well. Despite the remonstrances of some of the men who had gone to bed early, we kept up a raving fire until we had dried our blankets utterly, and we then slept gallantly till morning.

I dwell the more on these little incidents of woodland life to show

that we were camp-pleasurers as well as campaigners. I think it will not be ten years before all this country will be the resort of pleasure travellers in summer. I am sure I hope so.

Katahdin, by Dr. Jackson's barometrical measurement, is about five thousand three hundred feet above the sea. The woodmen were disappointed that it proved no higher, and if future observations detect any error in his, which were taken at disadvantage, I think it will more probably prove higher rather than lower. Its height from its foot seems to me considerably more than Mt. Washington from the Notch, — it is bolder and more precipitous on almost every side, rising from a lake country on the south and west. It is granite from top to bottom, — on it and the mountains near it, for it is not in a range, rest the later geological formations of the State.

Some wonderful precipices have been formed on its sides by slides and rock avalanches. We rested under the projecting side of a boulder which had rolled some hundreds of feet down the hill and stopped. The cavity merely in which we were would have sheltered fifty people. The richness and beauty of the vegetation of the lowest parts of the mountain is beyond description. Sincerely yours,

F. I.¹

The Beaverfoot Valley and Mt. Mollison.

By J. HENRY SCATTERGOOD.

Read February 13, 1901.

DURING a short sojourn at Field, British Columbia, in the summer of 1900, I learned of the existence of two mountains known as Mt. Vaux and Mt. Goodsir, south of the Canadian Pacific Railway and somewhere between the Beaverfoot River and Ottertail Creek. Inasmuch as mountains with names are comparative curiosities in this great Rocky Mountain chain, these two naturally attracted more than my passing attention, and all the more so when I found that they had been given these names by Dr. Hector of Palliser's expedition, as early as the year 1858, that both had been put on his and upon most subsequent

¹ I think this is the first paper which I signed "F. I." I did so because these letters follow my initials E. H. I then invented the name "Frederic Ingham" to match the F. I., and I have used "Frederic Ingham" since as a sort of double of mine. One of the collections of my stories is called "The Ingham Papers."

maps, and that, in fact, they were the oldest-named peaks in this immediate vicinity. Furthermore, both were represented to me as being very high and bold, and as affording magnificent opportunities for mountain-climbing. Accordingly I decided to spend three or four days in an attempt to first of all find, and then ascend, Mt. Vaux, which was said to be the lower of the two.

Very little could be learned before going about the approaches to these mountains. Mt. Goodsir was said to be very prominent in the view from Mt. Stephen, and also to show up well from the Mt. Lefroy side; and Mt. Vaux, always mentioned in the same breath, I supposed to lie very near to it. Any approach from this direction, however, would have to be made by way of the Ottertail valley, a course that I was reluctant to take, thinking it would not lead me very near. On the other hand, inasmuch as both Vaux and Goodsir had been first seen and named from the western side by Dr. Hector, as he came north up the Kootenay-Beaverfoot valley, an approach from this valley naturally presented itself as the proper one to best enable me to locate Mt. Vaux.

Unfortunately there was no map at hand except the rough one in the railway time-table, which of course could give me very little assistance. Furthermore, there did not seem to be anybody in the town of Field who knew anything of this country, nor yet in Palliser was there any one who had ever even heard of these names. Hence, whatever I could learn before starting was limited to condition of rivers and traditions of trails, and left as a complete blank the locations of any mountains. This much, however, I did learn, — that there was an Indian trail up the Beaverfoot valley on its east side, starting near Leancoil; that to reach it, it was necessary to cross the Kicking Horse River at that place; and that, in its then flooded condition, such crossing was an impossibility. I also learned that there was a lumber-road leading from Palliser, where the railway crosses to the south side of the Kicking Horse River, back to a point opposite Leancoil. To follow it seemed to be the only course open to me.

I had decided to spend not more than three days at the most in the whole excursion. There seemed no necessity for horses for such a short expedition, — in fact, except for crossing streams,

they would have considerably delayed us. Notwithstanding the trouble we afterward experienced on this score, on the whole we were glad that we had not taken them, and that we had started light and with only ourselves and provisions to look after. We were three, Christian Häsler and Jacob Müller, Swiss guides, and myself.

Leaving Field in the afternoon of August 18th, on the west-bound train, we were soon at the northerly base of the great Ottertail range. A glimpse up the Ottertail valley from a point near Boulder Creek had revealed for a moment Mt. Goodsir, although at that time we did not know it.¹ It is the great mass which rises far up on the right of the valley, and which is topped with three great towers, the nearest of which only is visible, and which seems to be falling over toward the north.² Ottertail Creek, which is crossed by a high bridge, makes a long sweep southward down the Kicking Horse valley for three miles before it at last empties into the river of that name. Of course, we did not know that we were even now near Mt. Vaux, for we were under the impression that it was situated up the Beaverfoot valley and somewhere near to Mt. Goodsir. But as a matter of fact we were at its very foot, for Mt. Vaux is³ the left-hand massif as one looks eastward⁴ toward Leancoil from the "C. P. R." The right hand one, the beautiful pyramidal spire, is the familiarly known "Chancellor," which is frequently confounded with Vaux. The two are separated by a stream that empties into the Kicking Horse a little north of Leancoil.

As we looked at the Kicking Horse, we were entirely convinced that it would have been impossible to get across at that time, although if a ford had been possible, a whole day could have been saved. We planned, however, to get back that night from Palliser to the junction with the Beaverfoot, and to make an early start up the valley the next morning. This junction is situated about two and a half miles to the south of the railway. The low land hereabout, together with the wide valley

¹ This is the only point from which this mountain is visible from the railway.

² See Plate XXXIII., Fig. 3.

³ For a full discussion of this subject, see my notes appended to the Report of the Councillor of Exploration in this issue of *APPALACHIA*, p. 376.

⁴ See Plate XXXIII., Fig. 4.

of the Beaverfoot in the distance, made the country seem comparatively open.

Palliser was reached about four o'clock. The first thing I did was to have a talk with a Mr. Wells, who owns a saw mill, and whose lumbermen have huts in the Beaverfoot valley, and who had built the lumber road from Palliser to the Beaverfoot. Learning from him of the old Indian trail up the valley and of the general whereabouts of the lumber-huts, we had at least something to start with; and accordingly we set off, carrying provisions for four days and intending to sleep in the huts that night and the next, and to find and ascend Mt. Vaux on the morrow.

The distance to the first camp, which is locally known as "the burned camp," is twelve and a half miles. Leaving Palliser at 4.30 P. M., we traveled through a gently undulating valley, which had been mostly burnt over, and was particularly uninteresting. The road was fair, though muddy, and we made good progress. Occasionally we would get glimpses of the Kicking Horse, as it wound its way through the deep gravel cut that it has made for itself. In about ten miles we came to a fence which runs north and south down to the river, and near which are good water and a small shelter-hut. This we reached very opportunely, for at just that moment a rainstorm broke upon us. It was short-lived, however, and the evening cleared sufficiently to promise, as much as is possible in that country, good weather in the morning. A little beyond this fence, which we left at 7.30, we could hear in the darkness the roar of the great Kicking Horse Falls near by, but we could see nothing. Upon our return we had an excellent view of them from this spot, which is perhaps three quarters of a mile distant. The river was full, perhaps a hundred and fifty feet wide, and fell sheer for forty or fifty feet, making with the spray which rises in great clouds above it, a very pretty picture.¹

Our course by this time had led us a mile or so to the south of the junction of the Beaverfoot with the Kicking Horse, and had brought us into thick spruce woods. By the aid of the lantern we were able to slowly pick our way through the dark

¹ The view, however, from this road is not so fine by any means as one from the opposite shore at a much nearer point, reachable, as I understand, from Leancoil, whither persons desiring especially to see these falls should always go.

forest, until at last, at 8.40, or in four hours and ten minutes of almost continual going, we reached "the burned camp."¹ Here we found about a dozen old huts, mostly in ruins and some burnt, although one, the sleeping quarters, was in excellent condition, and fitted with bunks, etc. We were in good luck to find such comfortable quarters, and with the stars shining brightly and every prospect of good weather, we had nothing to prevent passing an excellent night.

The morning of the 19th was as clear as could be desired, barring the valley mists which surrounded us, and at 4.55 we had broken camp and were ready to start. It was our intention to cross the river, get quickly to the foot of Mt. Vaux, which we thought must lie almost opposite to us, and ascend it that day. The low mists completely hid all the mountains for several hours, so that this deception was longer-lived than it otherwise would have been. For Mt. Vaux was, of course, at that time several miles to the north of us; and the nearest mountain to where we supposed it to be was, as we learned later in the day, fifteen miles to the southeast of us. And there were streams between! Underestimating this difficulty, for we had as yet not seen the Beaverfoot, we decided to press southward on the wagon road as long as it continued near the river, and then to cross at the first convenient point and strike for the trail on the other side. We knew of the bridge to the north, but did not wish to go so much out of our way.

Two and a half miles of easy walking brought us to the second, still utilized lumber camp. It is a first-rate log-cabin, tight and warm, with stoves, bunks, tables, etc., and is situated on the Beaverfoot's west bank, two and a half miles from "the burned camp." Between the two camps and the river there is very little else than thickly-wooded muskeag. There are, however, some fine, large trees near the river, and considerable timber has already been cut out.

A single glance at the Beaverfoot brought us dismay, for we

¹ This camp is located about a quarter of a mile from the Beaverfoot, and on a road running southwards to other camps up the river, and northward to a floating bridge about a mile below. The wagon road from Palliser comes into this north-and-south wagon road about a hundred yards to the south of "the burned camp," so that to reach this camp it is necessary to come back this distance.

knew that a crossing there, or near there, was out of the question. The stream was deep and not less than one hundred feet wide, and was running five or six miles an hour. There was nothing to do but to retrace our steps through "the burned camp," and on for the other mile to the "floating bridge." By the time that we had done this, it was 6.40, and to our inexpressible disgust and indignation we found that the bridge had been uncoupled by the lumbermen to let down their logs. Of this we had heard nothing at Palliser. Our only course now was to cut down a tree large enough to reach across. One attempt to do this failed, and we had the negative pleasure of seeing our tree fall short of the other bank by a scant foot, swing slowly round, and float away. However, a second attempt proved more successful, for with the aid of an old axe, the reward of a third journey to "the burned camp," and our small hand hatchet, we felled across the stream a two-foot spruce, which no doubt will serve the purpose of a bridge for years to come. It is located about three quarters of a mile below the lumber-camp, and about a half mile above the junction of a stream joining the Beaverfoot from the east.

Our course along the river to this point had been somewhat facilitated by the half-trail that exists along the bank, but with all of these delays the time had slipped by, so that it was 9.10. At about this time the mists began to clear up, and we saw the beautiful Ottertail range directly before us, but no mountain that we thought could be Mt. Vaux. It was evident that any ascent was impossible that day, so we contented ourselves with the thought of going up the valley and reaching the foot of our mountain, an undertaking requiring, as we afterwards discovered, a whole day for itself.

Once over the Beaverfoot, we planned to strike across and always up the valley in order to meet the Indian trail which we knew lay somewhere on the east side. This we reached¹ about 10.45, but only after traversing a great muskeag a mile wide, and

¹ We found the trail about two miles southeast of the lumber camp. All of the country between the trail and the river, both up and down the valley, was muskeag. The trail keeps up on the slope to the east of the swamp and finds its way to the Kicking Horse River and also probably — although of this I am not certain — to the floating bridge below "the burned camp."



MT. MOLLISON FROM THE BEAVERFOOT VALLEY.

From a photograph by J. H. Scattergood.

wading across the stream that comes in from the east. Once on the trail, we found it well-graded and distinct, except in swamps, where great care not to lose it is needed. Its general tendency is to keep on high ground on the eastern side of the valley, and in doing so it crosses two or three of the low-lying gravel spurs of the lower Ottertail mountains. It was a typical Indian trail, winding around logs and doubling on itself over and over again in the most exasperating manner.

The woods in all of this region are very thick, with much fallen timber, and hard to pass through except on the trail. Years ago a forest fire swept through the eastern side of the valley, but since then quite large trees have grown again. The largest ones are near the river banks and in the western slopes, where there are some fine spruce belts. Bears abound; we heard one and saw many fresh tracks. Beaver and otter are also said to have been plentiful in this valley. Every summer a party or two of Stoney Indians, from the reservations lying to the south, make their way through here for hunting purposes.

At one in the afternoon, we reached a small elevated plateau, where were beautifully located the tepee-poles of a former Indian encampment. From here we had our first view of a mountain still far ahead, towering with its sharp double summit far above everything in sight. In fact, so prominent did it seem from both down and up the valley, that I immediately felt sure that it must be Dr. Hector's Mt. Vaux. Afterwards, upon finding our mistake, I named it "Mt. Mollison," in honor of the kind hostess of the Mt. Stephen House at Field, who had made possible my expedition. I decided to ascend it the next day.

A tiresome walk of six miles through woods of spruce, birch, and aspen brought us to Ice River.¹ This is a good-sized stream, at least thirty or forty feet wide and a foot and a half deep. Its current is very swift, and the color of the water indicates glacial sources. It cuts through the deep gorge between the end of

¹ The point where the trail meets Ice River is, I fancy, somewhat over a mile above where that stream empties into the Beaverfoot. In this vicinity the trail becomes somewhat uncertain, but I suppose it crosses the stream near here, and then continues on its course up the Beaverfoot valley. About a mile further up Ice River another trail appears on its eastern side, and goes, I was told, some distance up that valley.

the westerly spur of the Ottertail range and Mt. Mollison, whose slopes come down to form its eastern bank.

Crossing Ice River was another problem which delayed us considerably, for we spent no less than two hours and a half in getting over it. A tree, which we cut down, proved just too short; and one of us was compelled in the end to wade through the torrent, braced by the rope and his ice-axe, to a great pile of driftwood on the far side, from which drift logs were dragged out by the rope to form a frail bridge. This was at the great turn of Ice River around the spur of the Ottertail range. By the time we had found the bit of trail on the other side, it was 5.30. We therefore decided to ascend a few hundred feet and sleep in the woods on the slopes of Mt. Mollison, whence we could make an early start in the morning for the ascent. We found a good place near a stream about two hundred feet above Ice River, and at an altitude of 4300 feet. During the whole day the weather had been perfect, and the night continued equally fine.

Starting from camp at 3.45 the following morning, the 20th, with weather conditions again as perfect as could have been desired, we soon found ourselves above the thickest woods, and, utilizing the open spaces on the mountain-side, we ascended rapidly to the first great ridge or buttress (alt. 6125 feet, time 5.20). Behind this ridge, which turns around abruptly to the northwest, there lies a beautiful little valley which is almost enclosed by the slopes surrounding it,—an ideal place for mountain goats. We kept a sharp watch for these and other game, but saw none, although countless tracks were in evidence.

From this ridge, the early morning view was superb. Directly below us stretched the great Kootenay-Beaverfoot valley, until eighty to a hundred miles to the southeast it seemed to merge into the mountains of the Continental Divide. The Beaverfoot River could distinctly be seen to rise in two branches, one in the mountains to the east of Mt. Mollison, and the other in two extended swampy lakes very near the height of land in the pass itself. The branch which rises in the mountains has two sources, the largest of which is the one nearest Mt. Mollison; these unite, take a great turn to the northwest, and flow through

two small, swampy lakes. Directly across this valley lay the Beaverfoot range, thickly wooded high up on its slopes; and further to the south, with its bare limestone summits, continued the Brisco range, which was Dr. Hector's name for the same chain on the Kootenay side of the pass. Both of these had that indescribably delicate purple hue which one occasionally sees from mountain heights. Beyond them was the great Columbia valley, parallel to and much wider than the Beaverfoot, and far off to the west, beyond the Columbia, the snow-clad Selkirks stretched their unbroken chain. The sun was just lighting up the snow tips of the Ottertail range, the eastern side of which had begun to come into view across our northwestern arête. And then behind us in deep shadow frowned the cliffs of Mollison itself.

The extent of this great Kootenay-Beaverfoot valley was most impressive. Its width was at least four miles, and this seemed to increase down the Kootenay between the Vermilion and Brisco ranges. The pass between these rivers lies five or six miles further up, and is so low that it is difficult to distinguish its exact location.

Above the ridge, where we rested, besides the numerous alder bushes, we found many ancient charred stumps, but no live timber. The formation changed in character at about 7000 feet altitude from yellowish slates to hard metamorphic rock; and from this height the mountain rose above us in steep cliffs and outlying buttresses. These latter we continually skirted and crossed, making always for the foot of the southeastern arête. After traversing about five of these buttresses we reached, at 7.30, a point directly under the great saddle in the northern arête near the summit of the mountain. Finding, to our surprise, good water under the rocks, we sat down to partake of some further breakfast, and to enjoy again the glorious view of the distant Selkirk range, now lighted up by the sun from end to end.

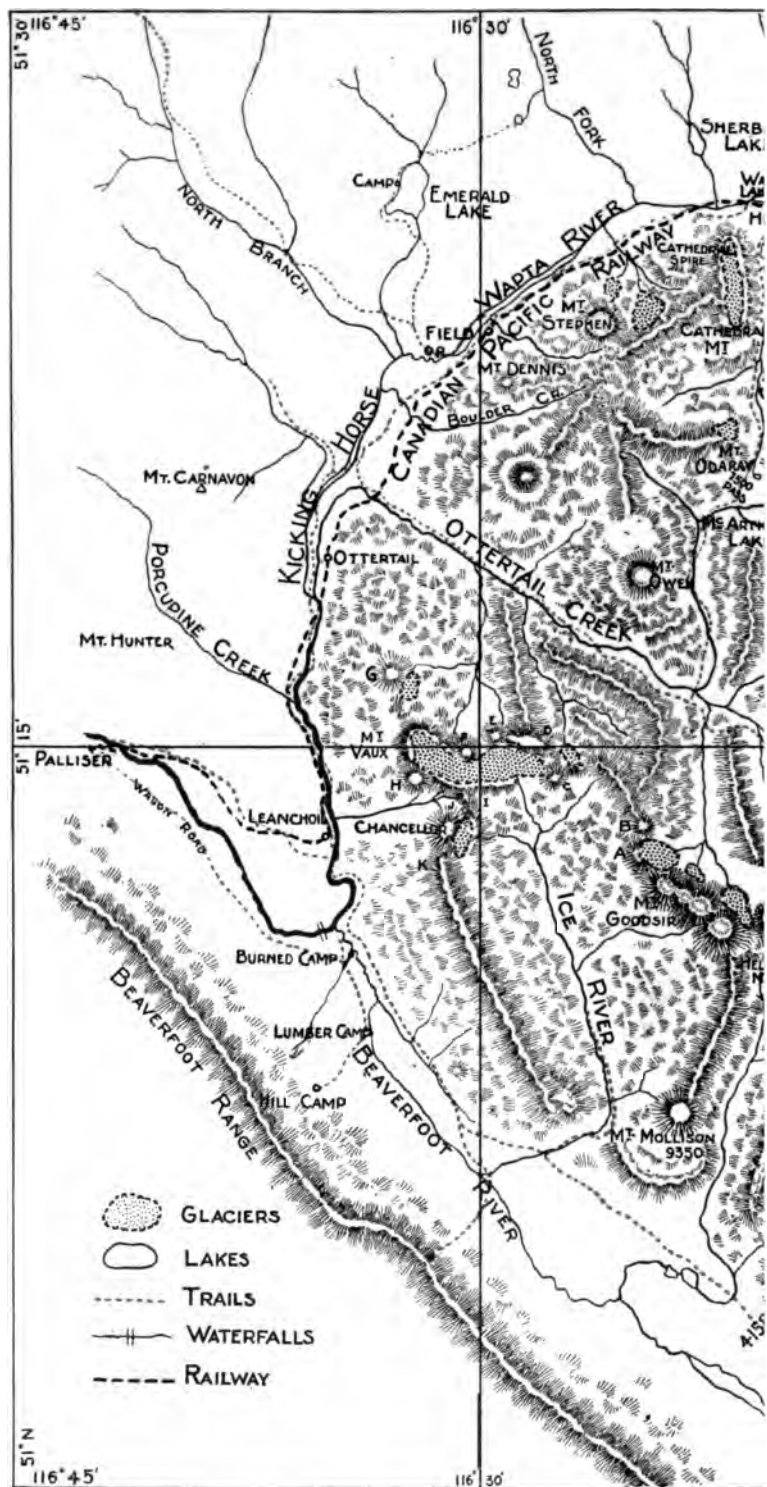
The southwestern side of Mt. Mollison is very steep and holds almost no snow, so that it seemed quite bare. The upper portion of the mountain consists of a thin, double-crested ridge, very steep on both sides and with great buttresses extending out in all directions to form the base. The ends of this ridge, form-

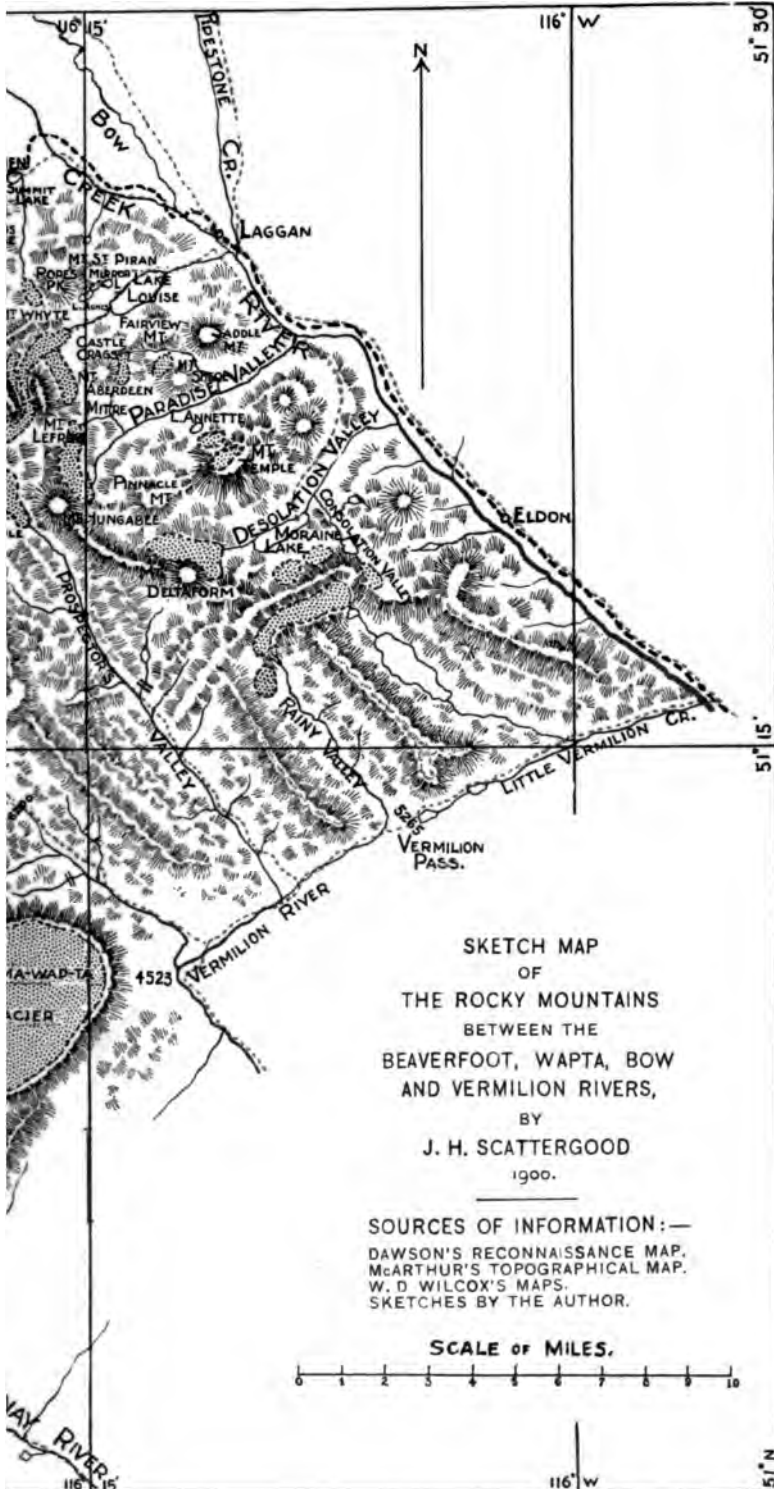
ing as they do the northwestern and southeastern arêtes, are steep and difficult to traverse, but a way could be seen up the southern side a little under the southeastern arête. Heading for this point, and ascending several hundred feet over scree, we roped at 8290 feet, and began to climb the steep rock slope. We found this to be pleasant climbing, and easy, because of the numerous cracks and ledges, which had been produced by the horizontal cleavage of the rock. In consequence, excellent holds could everywhere be found, which were, in addition, very firm, and in this respect showed marked contrast to the friable rocks of which Mt. Stephen and Cathedral Peak are composed. At the top of this slope, and very near the arête, we found a curved snow-couloir, which ascended parallel to the arête for four or five hundred feet, and then turned to the right and headed into the arête itself. The snow being in good condition, the ascent up this couloir was easily accomplished. Near its head we crossed to its western side and took again to the rocks. Skirting to the north and climbing the steep western face of the final summit,¹ we reached the top at 9.15, and found by the aneroid that it was only 9350 feet in altitude. That we were not on the real Mt. Vaux was evident from the fact that a mountain of this altitude would not have been named by Dr. Hector, while mountains a thousand feet higher were left unnamed.

The instant we surmounted the final ridge, there burst upon our vision a magnificent vista of snow peaks, glaciers, and valleys which beggars description. Near by, and far and away the most prominent object in the entire circumference, rose the massive form of the tri-peaked Mt. Goodsir. Connecting Mt. Mollison and Mt. Goodsir was a very high divide which separated the Ice River valley² from the mountain branch of the

¹ A second summit, slightly lower, to the north, is separated by a deep chasm from the southern summit.

² The Ice River valley entirely separated Mt. Goodsir from the more northerly peaks of the Ottetail group. Speaking of this valley, G. M. Dawson says (Geol. and Nat. Hist. Survey of Canada, 1885, p. 122 B): "The valley of Ice River runs northward for about seven miles into the heart of the Ottetail mountains, between Mt. Vaux and Mt. Goodsir of Hector, and terminates at the base of a high, narrow ridge, which separates it from the Ottetail valley. It is deep and narrow, being closely hemmed in by the neighboring mountains, while the stream itself is a mere torrent, often encumbered by masses of rocks from the rough mountain slopes. The mountains at the head of the valley are covered





Beaverfoot. Across Ice River and at its head lay the beautiful northerly group of Ottertail mountains, with their eastern flanks quite covered with glaciers. To the northeast could be made out in dim outline the high mountains of the Continental Divide; and to the west, at our very feet, stretched the great valley of the Beaverfoot, bounded on its other side by the Beaverfoot mountains, which in their turn served as a foreground for the matchless Selkirks beyond. The whole panorama was one of exceptional grandeur.

One of the most surprising parts of the entire view was an enormous high-level ice-field back of "Helmet Mountain,"¹ which completely covered a great plateau of at least twenty-five or thirty square miles, and which I suppose must send tongues down into several different valleys. Two of these tongues come a little way down into the valley of the mountain branch of the Beaverfoot. The altitude of this large glacier² cannot be far from 9000 feet, as it seemed almost upon a level with the top of Mt. Mollison.

The sky line to the northeast was formed by Mts. Odayay, Biddle, Hungabee, Temple (behind all), and Deltaform. The characteristic snow-covered summit of Mt. Temple could very easily be recognized, but the precise outlines of some of the other peaks could not be so distinctly seen at that distance. A summit just appears above the Wash-ma-wapta glacier which I take to be Storm Mountain. In the east, Mt. Ball, with its rounded snow summit, as described by Dr. Hector, is pretty certainly identified.

The great Selkirk chain, although forming a striking picture, was hard to distinguish peak for peak over the sixty miles that lay between it and ourselves. We succeeded, however, in mak-

with glaciers, one of which shows, from a distance, a cliff of solid blue ice which is probably several hundred feet in thickness."

¹ A fine helmet-shaped peak to the northeast of Mollison and southeast of Goodsir I have ventured to name "Helmet Mountain," and the sharp peak across the divide to the east of Goodsir, "Mt. Sharp." Both of these can also be easily seen from the Ottertail valley and from Mt. Stephen. A glacier lying between Goodsir and Sharp sends its waters north into Ottertail Creek, and another glacier upon the eastern flank of Mt. Sharp drains eastward into the Vermilion River.

² I suggest the name "Wash-ma-wapta glacier," this being the old Stoney Indian name for Ice River (as per G. M. Dawson, same report), which is now abandoned.

ing out Sir Donald, Dawson, and MacDonald, but all these great peaks in the Glacier House region seemed to be completely eclipsed in size and height by several mountains in the same range far to the south of them and lying southwest from Mt. Mollison. One of these particularly was by all odds the most prominent in the whole chain. I should judge it to be 1500 feet higher than Sir Donald, and to lie about sixty miles south of it, somewhere between the east and west Kootenay districts. Its general outline suggested great mass and showed two deeply-separated peaks. The size of its enormous base was no less remarkable than its apparently increased height over other mountains in the Selkirk range.¹

We were loath to leave the summit, but inasmuch as I had planned to get back to the lumber-camp that night, a timely start was necessary. Hence at 10.30, after a delightful hour and a quarter had slipped away, some of which I had spent in photographing, we began the descent. For the sake of variety we accomplished this entirely on the western face of the mountain. The 1500 foot descent down this steep side, directly beneath the summit, furnished some very interesting rock-climbing, although with the perfect weather conditions and no snow, it was without difficulty. Passing our roping-place at 11.55, we continued down to the scree where we had found the water, and rested there for lunch.

Not far below this point, the westernly dipped slaty strata began, but above this the rock was all volcanic. I did not observe the fused condition of the slaty strata near its junction with the intrusive mass, which is alluded to by Mr. Dawson.²

Our lunch finished, we started from the rock to traverse the buttresses. We made very rapid time, finding it possible to glissade in a few places over the finely broken slate. Our descent over some of the lower slopes and through the woods

¹ I am aware that Mt. Dawson, Mt. Sir Donald and Mt. Bonney are considered to be the highest mountains of the Selkirk chain, and that consequently the existence of these higher mountains further south will very likely be doubted. I have no hesitation, however, in allowing the above observations to stand exactly as they impressed me at the time when I had a panorama of the entire range, and will also add that the view southward toward these mountains from the summit of Sir Donald itself only confirmed me in the belief that they were higher.

² Preliminary Report, 1885, Part B, p. 122 f.

was almost a run, and we arrived at our sleeping-place at 1.50, having descended 3500 feet in an hour and a quarter.

Resting until 3.05, we set off again to cover the ten miles to the lumber-camp, which we thought we could easily accomplish by 8 P. M., with our bridges all built and our trail well-known. In this, however, we were too sanguine, for although we knew the trail, as we supposed, yet we lost it in a swamp for an hour and three quarters, which was worse than any mishap in first going over it. With this long delay, we found ourselves at dusk in the unpleasant position of having two miles of muskeag and the river between the camp and ourselves. There was nothing to do but to plunge in and wade. The stream, alluded to above as "the stream that comes in from the east," was a troublesome one to cross, being five or six feet deep and twelve feet wide; we were again compelled to resort to the old game of crossing on a tree, which we had dragged from some distance. We did not reach the Beaverfoot until after eight, when it had become pitch dark, and we could hear but not see the river as it rapidly glided by.

A difference of opinion arose as to whether we were above or below our big-tree bridge, but settling it that we were below, we started up stream. A wearisome hour of plunging over logs and falling into holes at last rewarded our efforts, and we found it at nine o'clock. It was a curious sensation to have to walk a tree-trunk in the dark with a deep and swiftly-flowing stream to receive us if we slipped, but with the help of our tiny candle-light we made in safety its hazardous passage.

Thinking now that our troubles must be over, we dreamed of the hot coffee and bacon that would soon be refreshing us. But here again we were mistaken. One of the guides insisted so vigorously in beating back through the woods from the river, to find the road, that I consented to the plan. But no sooner had we left the hard river bank than the muskeag began again. I think I can truly say it was the worst scrape I have ever been in. The forest was thick, the fallen logs innumerable, and the water deep and icy cold. We floundered and plunged, and scrambled up again, ever hoping that we were across the morass, when suddenly we heard again the familiar swish of the river, and found ourselves at the identical spot at which we

had entered. We had made a perfect circle like the freshest kind of tenderfoots. It was fortunate that I saw its humorous side, for something was needed to offset the many "Donnerwetters" that broke the stillness of the night. It was my turn now, and my orders were "*Immer bei dem Fluss.*" Again we started, and again we scrambled and fell and lunged, but always near the sinuous stream. After what seemed miles of curves, but which probably was not a full mile, the "Donnerwetters" at last gave way to expressions of joy, for the camp was reached. We were cold and tired and ready for anything, and this old cabin seemed a perfect heaven. We had spent an hour and a half in coming this short distance, and had been on the go for almost twenty hours. A hot roaring fire and hot coffee never seemed so good before, nor did I dream that board bunks could be so comfortable.

Next morning, the 21st, broke clear and cold, and found us starting at 5.50 on our fifteen-mile pull back to Palliser. We took it quietly, passed "the burned camp" at 6.25, the falls at 6.50, the fence-hut at 7.15, and came into Palliser at 10.20, just in time to take the train back to Field. We had been gone three days and had covered about sixty miles. It was a hard-working expedition, but a most enjoyable one. My only regret was that we had not had more real mountain climbing.

Over the Carter and Twin Mountain Ranges.

BY HARRY W. TYLER.

Read December 12, 1900.

THE middle week of June finds me always ready — though not always able — to take a brief outing. It was my good fortune this year to be hit upon as a possible companion by your Councillor of Improvements.

An experimental road-walk from North Conway, involving a test of a knapsack, not new indeed, but on unaccustomed shoulders, brought me early one afternoon to our meeting-place, the well known hostelry in Pinkham Notch, honored by the name of Darby Field Cottage. The first picture which I ask

you to imagine on the screen is a solitary traveler, not at all romantic, enjoying at leisure the close-range view of Mt. Washington with the buttresses of Huntington's and Tuckerman's Ravines, and great snow patches, whose chill seizes one sharply as the sun sets. Across the road and stream are a joyous trio with bottles no longer full, and a certain, yet uncertain, demonstrativeness of manner, which makes the pedestrian wonder how soon he can cover the eight miles to the next possible lodging. The social barometer rises with the exodus of the hilarious three — may their horse have the intelligence to descend Spruce Hill — and the advent of the Councillor and the Youth, from their sojourn in the club camp at Hermit Lake.

You will perhaps infer that I am telling you about the less interesting half of the Councillor's itinerary, but the choice suited me, and indeed I had no alternative.

Our real work began next day, after a somewhat disheartening ride along the once beautiful but now stripped Peabody valley, to Nineteen-mile Brook. Its name I found, as we followed it, not to denote its length accurately — and I think Carter Notch seemed even higher than when last approached on snow-shoes from the south. Reaching the crest and the ponds, the human interest was not lacking, for there was the patriarchal Jock Davis of Jackson with a couple of fishermen. Their success was not what they doubtless expected from fishing in forbidden waters.

The ascent of Carter Dome from the notch has the advantage of making most subsequent trails seem easy, but once on top in clear weather, the view makes one forget fatigue. How large the mountain family of Carters may be I no longer know. North and South and Middle I recall, but East and West and Upper and Lower I'm not sure of. It reminds one of the Newtons. In spite of their number and their coy trick of receding when approached, we finally descend the last one, and after a somewhat aimless — as it seemed — promenade on the slopes of Imp Mountain are reinvigorated by the sight of the Lowe brothers, our excellent Randolph guides, and their blazing fire at the Club camp. After a wet thunder-shower, and a still wetter mile of undergrowth, I felt sincerely grateful to all concerned for not continuing the day's march to Gorham. Even

the necessity of sinking our noses deep into the fir-bed to escape the camp-fire smoke was cheerfully accepted, though one of us, unduly cheered by over-indulgence in patent coffee, perpetrated some kind of a midnight ghost dance on the big boulder across our fire, seeking fresh air and startling a vagrant rabbit(?).

A short morning scramble brings one to the craggy top of Imp Mountain, with fine views westward. The walk to Gorham over Moriah and Surprise from Imp Camp is made comfortably in about six hours. The first mile or two proves hard to follow, and unpleasant because fire of a few years since has left only bleached skeletons of the original forest; and the Councillor plans at once for a substitute route. Moriah when reached has an interesting, irregular summit with water near, and a magnificent view, which I will not attempt to describe.

The descent to Gorham, while not difficult, is rather rough and broken until Mt. Surprise, a northerly spur, is reached. From here local enterprise has made the way particularly easy, with an incidental private log-house, perhaps for sunrise parties.

Gorham has lost a suspension foot-bridge, well remembered through fourteen years, but it has an entertaining shoemaker philosopher, who shows with pride an early photograph of Phillips Brooks presented to him by the great preacher. We seek other consolation than philosophy from the shoemaker.

On the whole it is a good day's walk either from the outskirts of Jackson or from the Glen House over the Carter range to Imp Camp, a rather easy one from there over Moriah to Gorham. The path presents no serious difficulty of any kind, and is neither monotonous nor waterless. The views of Washington and the northern peaks, the Androscoggin valley and the extensive wilderness to the south and southeast are varied and interesting.

We lodge at the Ravine House and make an early rail ride to the Twin Mountain House, where we are to prepare for our longer walk over the Twin Mountains to the Forks of the Pemigewasset and the Saco valley. Barron and Merrill have promised men and assistance, but plumbers and paperers are more in evidence than guides. The few men who know the mountains well can't or won't go; but Mr. Barron's perseverance is unlimited, and, after some hours' search among a number nearly



VIEWS SOUTH FROM MT. BOND.

From photographs by P. B. Field.

coextensive with the entire male population, we have a body-guard — not “soldiers three” exactly, but well recommended and not unworthy of characterization. S——, the leader, is indeed a veteran of war as well as woodcraft, but time and tide have done their work, as we are now to learn. E—— is lean, aquiline, shifty, and absolutely profane; if it was his parents who named him “Jed,” they had prophetic insight, for no other name would fit him so well. He is of the type that prefers the axe to the plow, the rod and gun to either. H—— is heavy, powerful, taciturn, — on him we safely count.

Recruiting and foraging leave us only time enough in the late afternoon of Wednesday to follow the abandoned Little River logging railroad to Camp Three, and then back to Camp Two, for the point of departure from the stream for the North Twin is, or was, very blind. Hence our ascent is delayed, and we have the good luck to spend two nights and a day of rain under the roofs of Camp Two at the base of the North Twin, studying topography, meteorology, and the psychology of men and fishes — or rather of *a* fish. Under our roofs we find not only bunks which it is possible to sleep in, but a stove allowing a portion of its smoke to escape through the funnel, which can be set up and used. The delay also enables us to lighten our packs of sundry cans, although it enforces a certain prudence as to too rapid consumption — for example, brown bread being divorced from its normal accompaniment. The logging railroad, with its camps at regular intervals, shows Nature's struggle to repair her wounds. The stream which the railroad followed is steadily converting it into wreckage, especially the numerous bridges. As the rails have been transplanted once at least — from the New Zealand railroad — it is fair to suppose they will stay here until they become two streaks of rust, long after the camps have rotted out of existence. Our first meal has shown us that we are no longer cared for by the Lowes, and that our men are hewers and bearers, not guides.

The first half-mile of the ascent proves practically pathless, and our men are instructed as to clearing it out on a later day. We then follow a path fairly plain, but much encumbered with windfalls. Long before we reach the top the veteran is in trouble, and even when relieved of his load by the unselfish

Haines, makes haste but slowly. We have no choice but to send him back with Jed, and instructions to make the path clear at least thus far. We can now move on more freely.

The summit of North Twin shows us, from a height of 4783 feet and under a perfect sky, a grand view of the Lafayette-Liberty range, separated from that we are to traverse by a broad wilderness partially closed in by Garfield on the north. Haines's delight at looking down through the Councillor's binocular — his view including the chickens in his own door-yard — finds expression in his wish to give twenty-five dollars if his mother could have this view.

South Twin, Guyot, and Bond are now our successive objective summits, by an ancient path whose construction is interestingly described in Volume III of APPALACHIA. Such a ridge walk seems to me far more interesting in its views than a summit which one merely ascends and descends. Our attention is not overtaxed by a continuously wide outlook. We walk for perhaps four miles, with no great change of altitude, but frequent glimpses and occasional panoramas from a standpoint always new. We are traversing a north-to-south range, separated by the broad deep valley of the Franconia Branch from the slightly higher Franconia range, with its far more broken sky-line. Ahead of us loom Carrigain and Hancock, showing how far we have *not* to go before reaching water; on the east, the deep, narrow valleys of Little River and the New Zealand River separate us from the nearly parallel Field-Willey and Little River ranges, over which are the peaks of the Presidential range, in the same general direction as from Fabyan's. We seem not only out of civilization but indefinitely remote from it, in the heart of the wilderness.

Scrub has the one merit of growing slowly, and a path once well made through it is an almost permanent blessing. Between scrubby summits the path wanders vaguely through open woods intersected by innumerable deer trails, and the keen eye of our hunter guide notes an occasional bear track. Water is nearly absent, and progress limited by weight of packs and occasional path-chopping. Instead of descending Bond, we camp in the ravine between it and Guyot, where we have the great good fortune to find a small stream.



MTS. LAFAYETTE AND GARFIELD FROM THE NORTH TWIN.



CREST OF TWIN MOUNTAIN RANGE (LOOKING SOUTH).

From photographs by P. B. Field.

Our elevation in the steep ravine is probably 4000 feet; the fire is short-lived; the keen night breezes traverse our improvised shelter till we shiver in our heavy blankets. It can be little past three when a glorious sunrise shines straight into our faces from across the distant sky-line of Monroe and Franklin.

From the North Twin to Bond we have had continually fine outlooks on both sides. Once on Bond the view ahead unites them, grandly dominated by Carrigain, or as our guide knows it, "Lone Mountain." From a height of 4700 feet we survey the great East Branch wilderness as from a watch-tower. The steep slope of Hancock rises beyond our next objective, the Forks of the Pemigewasset. Of the river itself we can discover nothing. The way thither was pathless and seemingly endless at first through desperate scrub. The sight of the broad rocky river bed is revivifying, and there is a certain sense of grim satisfaction when we finally put up a beautiful black and white sign, "Twin Mountain House 15 miles,"—as if the distance *we* had come were really of interest to deer or squirrels or trout. Here at last we are out of range of sawmills and loggers. None come here but for fish and game.

It is a pleasant change to walk in the river bed, just full enough to give the fording and rock-to-rock leaping a spice of uncertainty, and not desperately cold when we tumble in. The Councillor's camera does great execution, regardless of a brief immersion.

The forest growth along the stream is especially fine at this June season, some of the great cedars seeming centuries old. Late in the afternoon, after many windings and long reaches, we ascend the beautiful and imposing Thoreau Falls, where the stream, now about the volume of the Ellis at Glen Ellis Falls, flows over great shelving ledges for perhaps half a mile. We emerge, with an odd sensation, on the abandoned logging railroad running from New Zealand up through the New Zealand Notch, of which we have a close view to the north. I say railroad, but only sleepers remain; the former rails are those we have left two days earlier turning to rust along the Little River.

We count on shelter and some variation of diet at a camp at Shoal Pond near by, but it proves to be preëmpted; and were it twice as large, we should not tarry with its present fishermen

tenants. It is a weary three miles to the Willey Pond Camp ; and when we reach it at dusk, it is dirty and close, but still most welcome. The little marshy lake is overhung by the precipitous south slope of Mt. Willey, but on the other side is a continuation of the flat desolation we have been following from Thoreau Falls, — the ruin wrought by the Zealand logging.

We left Twin Mountain House Wednesday afternoon and emerge on the railroad, after a steep descent, with mixed emotions and ragged shoes, Sunday forenoon. The fine weather holds, and the Councillor is interested in the path up Willey and the copper cylinder at the top. The joy of climbing without our packs counteracts our weariness, and up we go! They who climb Mt. Willey before the leaves and needles are worn off the path — if they ever are — will envy the arithmetical frog in the well, since he slipped back only two out of three. Still, the mountain is easily reached, the path is reasonably good, and the view, particularly towards Carrigain in one direction, and towards the range from Webster and Clinton to Washington in the other, is not easily equaled. Leaving our ascent of Willey out of account, we spent four nights on the way, and two and one half days in actual marching from Twin Mountain House to the Willey House. With the subsequently improved path, a party of experience and light equipment could make the tramp in two long days of good weather, but three would be much better. Our direction was certainly preferable to the reverse, as to views, and it would doubtless be easier to secure a guide at Twin Mountain than at the other end. An important factor in any itinerary must always be the absence of water for a camp from the base of the North Twin to the Forks of the Pemigewasset, a distance of about eleven miles, except for the little stream between Guyot and Bond, whose permanence in dry weather seemed to us doubtful.

But for limits of time and the Councillor's modesty, I would tell how admirably his plans and arrangements worked, and how much I learned about the most effective and elegant methods of transferring the whole or any aliquot part of the contents of any kind of a tin can to one's own interior, how easy it is to get on without the necessities of life when one must, how everlasting is a package of oatmeal, and how excellent a lunch may consist of sardines, chocolate, and raisins alone.

I have said nothing of the botany and geology, and almost nothing of the topography and the views. I took this tramp for pleasure, not instruction, and made no notes; most of you know better than I could possibly tell you, how much there is in a few such days, that can be known only by the actual experience, that makes a permanent bright spot in one's memory.

Ascension du Sir Donald par le Green's Peak.¹

PAR F. LEPRINCE-RINGUET,

Ingénieur au Corps des Mines de France.

APRÈS quelques jours de pluie suivis d'une belle journée et dans des conditions barométriques excellentes, nous partons pour faire l'ascension du Sir Donald, M. Cordes, attaché à la légation d'Allemagne à Péking, dont j'avais eu le plaisir de faire la connaissance à la suite d'une commune traversée du Pacifique, et moi, ayant pour guides Christian Häslér et Edouard Feuz d'Interlaken.

Départ de Glacier House au petit jour (8 h. 00, 1240 mè.). Nous suivons le chemin du glacier d'Illicilliwaet, à droite duquel nous remontons sur des pentes de neige, puis, laissant à notre gauche le torrent qui descend de la base du Sir Donald (et par lequel nous reviendrons), nous suivons la moraine du grand glacier.

Le soleil vient de se lever (4 h. 15), et les crêtes de la chaîne du Mont Hermit prennent de jolies teintes roses, tandis que les bois de sapins qui dominent Glacier House forment à ce fond un beau cadre d'ombre.

Une petite muraille de quartzite dont nous remontons une couche (5 h. 00, 1870 mè.) suivie d'une pente de glace, pas très compacte d'ailleurs et sur laquelle il faut tailler les pas. Après un passage un peu lent nous retrouvons la neige (5 h. 30, 1980 mè.). A notre droite sont les séracs du grand glacier, à gauche les pentes rocheuses du Perley Rock, dont les contreforts nous obligent encore à une petite escalade.

Halte de six minutes (6 h. 15, 2300 mè.). La vallée derrière nous commence à s'éclaircir, et le Sir Donald y projette sa grande ombre triangulaire, flanquée de celles du Green's Peak et

¹ Printed by permission from the visitors' book at Glacier House.

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de l'Eagle Peak. Bientôt la pente de la neige devient moins forte, et nous atteignons une croupe ensoleillée. Progressivement nous tournons vers le nord, de façon à longer la face sud-est du Green's Peak.

A une seconde croupe de neige, nous arrivons enfin (7 h. 30, 2740 mèt.) au haut du grand Névé d'Illicilliwaet. De là la vue est très belle, et comparable à celles que l'on a aux environs de Zermatt lorsqu'on atteint la frontière d'Italie. Au premier plan, un énorme champ de neige, duquel émerge une série de pics aux flancs neigeux, — le mont Fox, le mont Deville, le mont Macoun, — et brusquement vers l'est, cette neige limitée par une muraille à pic qui tombe dans la vallée très boisée du Beaver, assez large et bornée de l'autre côté par des collines vertes.

Remontant alors vers le nord une pente de neige durcie assez raide, suivie de quelques rochers, nous ne tardons pas à atteindre le sommet du Green's Peak (2930 mèt.). En cinq heures nous avons fait une ascension de près de 1700 mètres. Moins de 300 mètres nous séparent du sommet du Sir Donald, auquel nous ne devons arriver cependant, après bien des fatigues, que sept heures et demie plus tard.

A cette heure matinale, sans un nuage au ciel, la vue que nous avions du Green's Peak était merveilleuse et déjà excessivement étendue. Mais ce qui frappait surtout nos regards, c'était, tout contre, la masse du Sir Donald, dont nous étions malheureusement séparés par un abîme absolument à pic, suivi d'une crête aiguë située une cinquantaine de mètres au-dessous de nous. Les arêtes sud-ouest et sud-est de la montagne tombent avec une inclinaison de plus en plus grande, la seconde surtout, qui arrive à pic dans la vallée du Beaver, 1900 mètres plus bas. A peu près de tous les côtés, surtout vers la base, la roche plus ou moins disloquée, pend vers l'extérieur. Cependant l'œil exercé de nos guides percevait différents passages possibles, une sorte de cheminée dans le voisinage de l'arête, une pente entre deux strates qui descendaient un peu plus bas de l'ouest à l'est, une pente raide couverte de pierrailles et conduisant à un couloir bien au-dessous.

Nous cherchâmes d'abord à prendre la voie la plus courte, en gagnant le petit col qui relie le Green's Peak au Sir Donald.

Donc, prenant la corde — Feuz en tête, puis M. Cordes, Häslér et moi — en contournant la muraille verticale du Green's Peak du côté ouest, nous descendîmes lentement par une petite cheminée, puis le long d'une strate suffisamment marquée. En arrivant dans le voisinage de la pente de neige qui tombait du col, le passage sur des schistes micacés sans cohésion fut particulièrement difficile et même dangereux. Enfin après une heure et demie de ce travail, nous mîmes le pied (10 h. 20, 2840 mèt.) sur le Sir Donald, tandis qu'on distinguait à peine sur le Green's Peak le chemin que nous venions de suivre. Là, nous nous trouvions assez près de la fente entre les deux strates, et nous cherchâmes tout d'abord à nous y engager. Mais nous fûmes arrêtés bientôt par la couche de glace qui la couvrait.

Une seconde strate, un peu plus bas, pendant vers l'extérieur, était peut-être praticable. Attaché à la seconde corde, que nous tenions aussi solidement que possible dans une position peu commode, Feuz chercha à s'y engager. Mais après quelques mètres de dangereux efforts, il dut revenir. Nous étions un peu démoralisés, mais les guides ne perdaient pas courage.

Alors, tant par les rochers que dans la neige, nous nous dirigeâmes vers cette pente pierreuse que nous avions aperçue beaucoup plus bas, et à 12 h. 15 nous pûmes mettre le pied sur un espace commode (2740 mèt.), auprès d'une cascade, pour nous reposer un peu et déjeuner.

A 12 h. 45 nous repartons, Häslér en tête cette fois. A quelque distance de nous un couloir où, de temps en temps, tombe une volée de pierres. Nous cherchons encore à escalader la montagne tout droit, en évitant le couloir. Peine perdue. Il faut nous résigner à le traverser par deux fois. "Vorwärts! vorwärts!" crie Häslér, et nous passons aussi vite que possible sur la neige parsemée de pierres et sur les joints arrondis d'un mur de rocher où l'eau tombe en cascade. Enfin, après ce passage dangereux, la montée devient un peu plus facile sur des éboulis et des pentes de neige. Nous atteignons la ligne de faite sud qui se continue par le Green's Peak et faisons une petite halte (2 h. 30, 3010 mèt.).

Cette fois, avec quelques flaques de neige, nous avons à escalader un quartz dur, aux angles tranchants, aux prises faciles, et nous atteignons enfin à 3 h. 35 le sommet du Sir Donald (3200 mèt.).

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Nous apercevons tout de suite le petit tas de pierres qui avait été élevé par les premiers ascensionnistes, et nous y trouvons dans une bouteille la carte qu'ils avaient laissée, portant ces mots : —

Emil Huber
Zürich Switzerland and
Carl Sulzer
Winterthur Switzerland
Members of the Swiss Alpine Club

Porter Harry Cooper
Climbed from small glacier on south side through couloir and south arête to summit on July 26th, 1890. Left camp 3.50, arrived summit 10.15. Wonderful view. Three cheers for Switzerland !

Ainsi donc, *jour pour jour*, il y avait neuf ans que la première ascension avait été faite !

La vue était sans limites, indescriptible. Seuls de petits nuages légers flottaient à une très grande hauteur dans le lointain, dans cette atmosphère parfaitement calme. Nous dépassions en hauteur toutes les montagnes voisines (à l'exception, je crois, du mont Fox¹) qui laissaient complètement voir les plus éloignées, véritable tempête de pics neigeux. Quelques notes paisibles, comme la longue vallée rectiligne du Spillimacheen s'éloignant vers le sud-est, et celle du Beaver, couronnée de plateaux comme les "alpes" de Suisse. Derrière, la chaîne des Rocheuses, où l'on distinguait le mont Assiniboine (E. 28° S.), les "Three Sisters,"² plusieurs pics extrêmement aigus, puis les vastes glaciers du Lyell et du Columbia, cette dernière montagne faisant une masse énorme dans le lointain (N. 13° O.). Et dans les deux quadrants dirigés vers le Pacifique et les Etats Unis, un chaos de montagnes incroyable.

A 4 h. 25 il importe de partir pour ne pas être pris par la nuit sur les rochers. Descente forcément lente. Nous arrivons sans encombre à 7 h. 30 au point où nous avions déjeûné, au coucher du soleil.

Encore un passage assez dur pour descendre le long d'une cascade et gagner la neige. Mais là, tout n'est pas fini, car une crevasse traverse toute la largeur du ravin. Nous gagnons la muraille du Green's Peak, descendons en nous arc-boutant dans l'étroite fente qui isole la masse de neige, gagnons un petit pont, et remontons alors facilement sur le névé.

Nous sommes enfin (8 h. 20) sortis des rochers où, à part

¹ Doubtless Mt. Dawson. — Ed.

² A name formerly applied to Mt. Goodsir. — Ed.

quelques deux heures de repos, nous nous sommes trouvés pendant onze heures et demie, sans pouvoir perdre un instant de vue la place de nos pieds, de nos mains, et de la pointe de notre piolet. Il reste 1200 mètres à descendre.

Après la glissade sur les névés et une marche sur la moraine, nous nous arrêtons extenués (9 h. 00), à la nuit, au bord du torrent du Sir Donald. Puis vient un trajet affreusement pénible dans la brousse et les rochers, au bord du torrent, à la lueur des lanternes. Les guides eux-mêmes trébuchent à chaque pas; enfin nous rejoignons le glacier d'Illicilliwaet, et à 11 h. 15 nous rentrons à l'hôtel, où, grâce à l'obligeante attention de Miss Mollison, un souper nous attendait.

Dans cette magnifique course de plus de vingt heures, où, à part le temps merveilleusement beau, nous avons rencontré un peu tous les genres d'obstacles qui rendent une ascension intéressante, nos guides ont fait preuve d'une sûreté, d'une endurance, d'une énergie, et d'une obligeance absolument parfaites, et que nous ne saurions trop reconnaître.

Ich habe den obigen sehr zutreffenden Notizen meines liebenswürdigen Gefährten M. Leprince-Ringuet hinzufügen, dass ich, als wir um 12 h. 15 auf dem breiten Absatz des Sir Donald ankamen, allen Ernstes den Vorschlag machte, den Aufsteig aufzugeben und auf dem nächsten Wege zurückzukehren. Es ist daher nur der Energie des Herrn Leprince-Ringuet, der Beharrlichkeit der vorzüglichen Führer, und dem belebenden Einfluss des Frühstücks zu danken, dass wir überhaupt weiter gekommen sind.

Zur Ermüthigung für Andere hebe ich noch hervor, dass ich ein gänzlich ungeübter Bergsteiger bin, und den Aufsteig in gewöhnlichen braunen Lederschuh — sogenannten "K." Schund — gemacht habe, in deren Absätze der Führer Christian Häler ein paar Nägel geschlagen hatte.

Ich habe ganz gegen meinen ursprünglichen Reiseplan sechs schöne Tage hier zugebracht, und scheide mit Bedauern und dem Wunsche „auf baldiges Wiedersehen!“ von dem freundlichen Gletscherhause und seinen Bewohnern.

HEINRICH CORDES, Berlin,

(*Deutsche Gesandtschaft in Peking, China*).

The Wapta Fall.¹

BY GEORGE S. VAUX, JR.

Read February 13, 1901.

To the lover of nature one of the charms which is a constant attraction to the portions of the Rocky Mountain system which have been made accessible by the Pacific Canadian Railway, is the consciousness that so little real exploration has been carried on that each visitor is practically a new discoverer. Most travelers arrange to make their stays in the mountains at Banff, Lake Louise, and Glacier House, these being the points which are best known. It appears probable, however, that in the immediate future Field is destined to become a centre of attraction which will rival either of the others, and of the points of special interest there the North Fork Valley is sure to be pre-eminent.

But little has been known of this district, the most comprehensive article upon it published being, I believe, that by Mr. Jean Habel, in *APPALACHIA*.² It was the reference there made to a fall which "in beauty and grandeur is hardly to be excelled by any other on our globe" that first attracted our attention to the locality. It was not, however, till last summer that we were able to carry out our intention of getting a glimpse of it. Our first view of this fall, with its surroundings of deep valley and great snow peaks, from the top of Mt. Stephen whetted our appetites for what we should find on a nearer acquaintance.

This summer was the first when any trail-making has been done, with Wapta Fall as its objective point. Our course was along the familiar route to Emerald Lake, where we camped for the night. The next morning, crossing the lake to its head in a boat, we traversed the shingly flats, and by a good trail zig-zagged up the face of the treeless ridge which flanks the lake to the eastward, between the Emerald range and Wapta Peak. To our left a beautiful cascade was tumbling down from one of

¹ It is now probable that the Canadian Geographical Board will adopt "Takakaw" as the name of this fall. In the Cree language this means "It is magnificent." The name was suggested by Sir William Van Horne.

² Vol. VIII., 327 *et seq.*

the hanging glaciers of the former mountains. Looking back, the little patch of water at our feet, in its perfect setting, told us most eloquently by its coloring of the origin of its name. Such green I had never seen elsewhere. Finally the timber was reached, and here the trail, upon which a large force of men was working, came to an end. We were now at an elevation of about 5350 feet, and some 1150 feet above the lake. From this point on there was a good deal of scrambling, such as those only are familiar with who have personally experienced what the undergrowth is in a British Columbia forest. At last, however, we struck some natural trails, well worn and kept open by the mountain goats, and, following these for upwards of a mile and a half, we crossed the col at its lowest point, and came out on the shore of a beautiful little lake, set in a lovely park at an elevation of 5800 feet.

Skirting the south end of this lake and following the stream flowing from it, through flower-decked meadows, we finally attained the western slope of the North Fork Valley, and, again fighting our way through the rain-soaked undergrowth, at last reached an old avalanche track, immediately opposite the fall, and commanding a splendid view of it. For a long time before we could catch glimpses of the cascade through the trees, its ominous booming had been heard, and it was with expectation aroused to the highest pitch that we pushed eagerly forward to gain the vantage-point from which the accompanying photograph was taken.

As will be observed, the stream has its rise in one of the glaciers which flow from the great Waputehk snow field, and thence runs through a gorge until it takes the sudden plunge over the precipice. A projecting ledge which is soon struck throws the stream out from the face of the cliff, and the balance of the fall, about six sevenths of the total height, spreads gracefully till it strikes the rock piles at the foot. As is usual with all high falls, the wind has a great effect on this long, descending column, causing it to sway from side to side, and great rockets of water are incessantly shooting downward. Even at our distance of probably a mile and a half, from time to time a deep booming was heard, loud above the roar of the cascade, sounding almost like great rocks falling down, but probably caused

by the sudden and explosive release of air which had been caught and compressed by the water in its downward course.

The surroundings of the fall are sufficiently attractive to be in themselves worthy of a visit. The great snowy peaks tower above the valley's sides, — Mt. Habel, Mt. Balfour, Mt. Gordon, Mt. Collie, — whilst its head is blocked by the rough mass of the Wapta glacier, a worthy rival to the famous Illicliwaet.

With the opening of another season this valley, it is promised, will be made much more accessible. A good livery service is to be maintained at Field, and a wagon road built to Emerald Lake. The trail which now reaches to opposite the Wapta Fall is to be extended to the glacier at the head of the valley, passing the Twin Falls, as well as the other lesser cascades referred to by Mr. Habel, and also a very wild canyon. A return trail is also to be built, skirting the ridge near Mt. Field, and descending to Field immediately opposite the hotel.

The height of the Wapta Fall has been a matter of some conjecture. Mr. Habel does not venture a definite estimate. Our own calculations indicate that the lower portion of the fall is about six times as high as the upper portion. The average length of time which it took the rockets of water to descend the higher section was about eight seconds, which would indicate a total height of approximately 1200 feet. Another method employed was by levelling with the hand level across the valley to the top and the bottom of the upper fall, the vertical interval being measured by the aneroid. The height thus shown is about 150 feet, giving a total height of 1050 feet. The exact foot of the fall is difficult to determine, owing to the piles of rocks which are scattered about in great confusion, and the clouds of spray which are constantly rolling up.

Whether to the general tourist this valley, with its great falls, will prove as attractive as the Yosemite, time will reveal. It lacks El Capitan and the South Dome. But it possesses a galaxy of true snow peaks and of mighty glaciers, which in California are entirely absent.



THE WAPTA FALL, CANADIAN ROCKIES.
From a photograph by W. S. Vaux, Jr.

The Club Camp at Lake Winnepesaukee.

BY ROSEWELL B. LAWRENCE.

Read October 10, 1900.

THE year 1900 marked the birth of a new Club enterprise, the erection of a permanent camp upon Three Mile Island in Lake Winnepesaukee, — a project interesting both in view of the Club's past history and on account of possible future developments.

The first night in camp under Club auspices, July, 1882, was spent in a rough shelter on the northern slope of Mt. Adams. The novelty of camping may have influenced many of the party, but the *raison d'être* was the ascent of the mountain. The camping trip of July, 1883, over the Twin Mountain Range, had for its object the enjoyment of the views from Bond, the tramp through the primeval forest of the East Branch of the Pemigewasset, and the visit to Thoreau Falls. The pleasures of camping, great though they were, did not furnish the incentive for the excursion. Even the memorable trip to Ktaadn was inspired by a longing to climb the grand peak, traverse the narrows, and look down upon the basin pond more than two thousand feet below. But the delights of living close to nature, tramping in the woods, breathing the fragrance of the balsam, and sleeping upon the boughs so captivated members of the Ktaadn party that a camp pure and simple was organized in 1889, and tents were pitched, and two weeks were spent at the northern end of Student Island in Mooselucmaguntic Lake. There have been many camps during the last decade, in the most of which the outdoor life has been the chief attraction, and the mountains have furnished only the incidents.

This development of camp life is a natural outgrowth of the Club's activity, and an important part of its missionary work in the community. In 1885 the need of a Club-room in town for business and social purposes was felt; in 1888 the Madison Spring Hut was erected as a mountain refuge; so now the growth of the camping spirit has come to demand a permanent home for outdoor life. Camping parties will still be organized to reach otherwise inaccessible peaks, and tents will occasion-

ally be pitched by other waters, but Three Mile Island, situated in New England's most beautiful lake, and watched over by Ossipee and Belknap, Passaconaway and Chocorua, will be the Club's camping home.

Three Mile Island is so called because it is situated three miles from Centre Harbor. It is about six miles from Weirs on the southern division of the Boston and Maine Railroad. The steamer Mount Washington touches at Bear Island, where there is a large boarding-house and a post-office. From this point it is about three quarters of a mile to the landing on our island.

In 1899 Mr. and Mrs. Edson C. Eastman, of Concord, N. H., offered the Club a lot of land on this island. The Trustees of Real Estate selected the southwest corner, and the engineer found the tract to measure 2.126 acres. A large red oak, which picturesquely overhangs the water on the south shore, marked the boundary on the east, and subsequently, in order to include the whole of this tree, a strip containing .198 of an acre was added, making the tract two and one third acres. Early in the past summer the southeast corner, measuring 2.955 acres, was added to the gift; the northerly line was thus extended across the island from the west to the east shore, and the Club holding became 5.279 acres. Moreover, a member, the writer of this article, has purchased and conveyed to the society an additional area of ten acres. The island comprises about forty acres, and the remainder, consisting of about twenty-five acres, has just been purchased for eight hundred and fifty dollars, so that its entire surface, together with the islet called Rock Island, is now the property of the Club.

In August of 1900 the island was the scene of the summer camping party. Under the direction of the Committee, J. Ritchie, Jr., and R. B. Lawrence, a cook-house was erected, and twenty-four tents, including a large dining-tent, were pitched. A week or two was spent in camp by thirty persons, while those visiting for a shorter time brought the total to forty. In spite of a rainy period in each week, there were pleasant days which were devoted to ascents of Belknap Mountain and Red Hill, and steamboat excursions to Green's Basin and other points about the lake. Bathing and canoeing were favorite pastimes.

The camp was a decided success, and all the participants were enthusiastically in favor of establishing here a summer home.

In the early autumn an appeal was issued, by authority of the Council and Trustees of Real Estate, to raise \$2150, wherewith to purchase the remainder of the island and build a permanent camp. The subscription was successful (see page 360), and the camp has been erected. Edward F. Stevens, of the firm of Kendall, Taylor & Stevens, kindly contributed the plans, and the building was erected by James P. Leighton, of Centre Harbor. The contract price was \$1323. Instead of making a subscription in money, H. P. Kelsey offered to contribute \$100 in trees and shrubs, including the expense of planting. His advice as a landscape architect has been already of great value to the committee. R. B. Lawrence also has substituted for his subscription the landing where steam launches can make fast. J. A. Crosby has contributed the printing. The Montalban Club has generously given the balance in its treasury, \$137.80; and the camping party of last summer bestowed upon the camp various useful articles, including the kitchen equipment and \$30 toward the expense of building the cook-house. Several members also subscribed toward the latter expense, E. C. Eastman and C. H. Sanders ten dollars each, and G. W. Yeaton five. F. W. Fiske presented a fine cooking stove, which unfortunately was lost in the lake.

It has been decided by the Trustees of Real Estate that the island, together with the camp, shall be under the charge of a committee, consisting of R. B. Lawrence, representing the Council, H. N. Shepard, representing the Trustees, and J. F. Beede, of Meredith, representing the general membership of the Club and a resident in the vicinity. It is not intended that the project, either in its inception or its continuance, shall be an expense to the treasury. The original outlay having been raised by subscription, the property is to be so managed that it will pay running expenses. In January of the present year a course of stereopticon lectures was given by Mr. Lawrence, thus raising \$205 with which to furnish the camp and provide for a float, boats, and other necessities.

The camp building is rectangular, measuring thirty by forty feet, and has a piazza ten feet wide on the front and sides. The

foundation piers rest upon a ledge, the only spot upon the island free from forest growth. The hall or living-room, in front, measures thirty by twenty-two feet and extends to the roof. Five large windows, with two smaller ones above, light this hall, while three doors open upon the piazza. The striking feature of the interior is the large chimney built entirely of lichen-covered rocks found upon the island. A convenient stairway and a gallery, which passes in front of the chimney and overhangs the fireplace, afford access to the chambers in the rear. On the lower floor the rear is divided into three rooms, one of which can be used as a kitchen. For the present, however, it is proposed to use the cook-house built for last year's camping party. The second floor in the rear consists of a single large room lighted by two double dormer windows. If desirable, this could be divided by light partitions into four rooms. A lookout upon the roof adds to the architectural effect. The building is so planned that it may be enlarged easily by extension in the rear.

Steam launches of different sizes can be hired by the day or week, and it would not seem advisable for the Club to own one. A small boathouse will therefore suffice, and that can be built upon a plan capable of enlargement. Rustic seats in different places, and possibly a rustic shelter at Chocorua Point, should be provided. The summer visitor will be encouraged to sleep under canvas, and on account of the uneven surface it will be advisable to build several board floors for tents. A great attraction would be an observatory upon the highest part of the island. Another way in which money can be spent to advantage is in thinning out the trees so as to give the more valuable ones a better chance to grow. Trails should also be made through the woods to the various attractive points upon the island. In these ways the property may be improved and developed, and rendered more suitable for camping purposes.

The Committee has not yet formulated any definite plans for the use of the camp and island. Experience must determine the needs of the Club. It is very probable, however, that during the first season the camp will be kept open by the Committee for six or eight weeks, and that members of the Club to the limit of accommodations will be received, a certain rate



CLUB HOUSE ON THREE MILE ISLAND

From a photograph by H. P. Kelsey.

being charged per day. Arrangements must be made in advance on account of limited accommodations and difficulties to be met in running the commissary department. Whether the regular summer camping party of the coming season will be held upon the island will be determined later by the Excursion Committee of 1901. The policy of the Club should be to arrange camping parties in other regions, but occasionally, perhaps once in three years, to hold the regular camp upon the island. Each year, however, the island camp should be kept open by the Committee for two weeks, and during the remainder of the season members, either individually or in parties, should be allowed to take the camp at a certain rental and manage it at their own expense. This latter plan will not be difficult, since there are neighbors upon Meredith Neck, Bickford & Brown, who run a steam launch, the Fawn, during the season, supplying campers with the necessities of life,—meats, vegetables, milk, ice, etc. By ordering a day in advance one can obtain anything that can be found in the stores at Meredith.

We have called this our Club's "camping home." The word "home" signifies permanence, and therefore many improvements of a sort not in harmony with camping ideals. The serious question therefore comes, How far from nature shall we allow civilization to allure us? Most important of all, the forest must be preserved, only such cutting being allowed as will give a better growth to the more valuable trees and open to the campers finer views of the beautiful scenery. Nature intelligently assisted will produce the desired results. No exotic should be planted, no orchid plucked up by the roots, and, without the careful consideration of those in charge, no tree should be cut or bush destroyed.

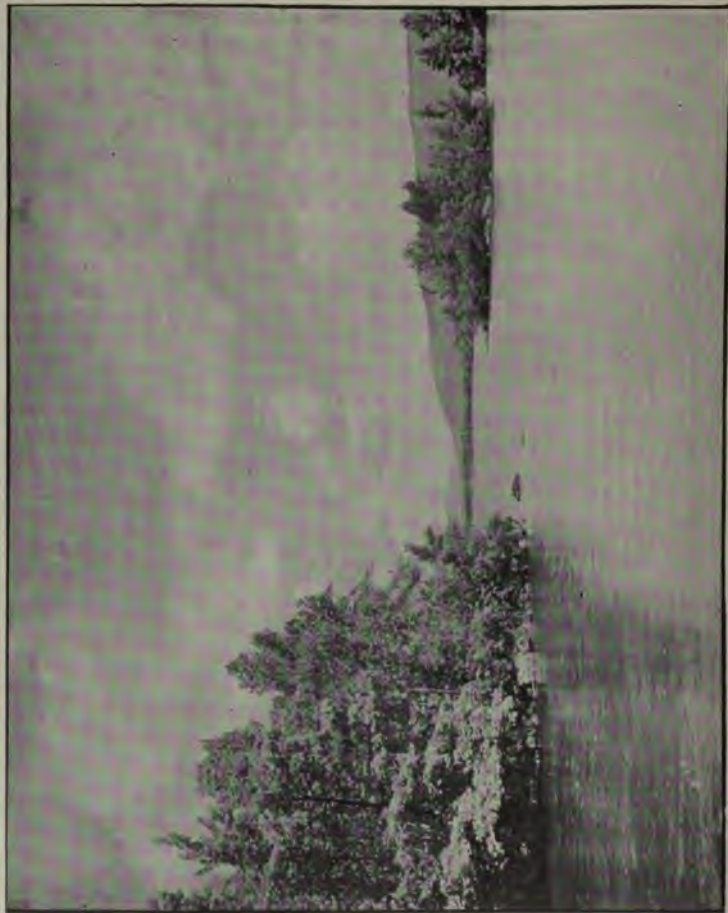
Moreover, all buildings should harmonize so far as possible with the surroundings, and nothing should be obtrusive to the sight or inappropriate to its intended uses. Already we are fortunate in the architecture of the camp, for the building looks as if it belonged where it has been erected. So far as it is possible for a framed structure, it harmonizes with its environment. The site for a boathouse has been selected, and when a building is erected, it is hoped to screen it from the public with a fringe of alders and water-maples. The landing could not be

hidden, but fortunately it is in a sheltered cove in the least conspicuous place on the island. Sites for tents must be selected among the trees and back from the water's edge, and the alder and witch-hazel must be allowed to fringe the shore. If small camps are ever erected, they too must be lost in foliage to the passer-by in boats. Moreover, that choicest spot, Chocorua Point, should not be desecrated by tent or camp, but remain as nature made it with the beautiful view it commands.

But not only should the natural beauties of the island be protected and no work of man allowed to mar; the campers also should live as close to nature as the rules of hygiene and a reasonable regard for comfort will allow. Golf and fine clothes should be tabooed; early hours, camp costumes, and simple fare should be the rules. Canoeing and swimming, fishing and sailing, tramping and climbing, resting and communing with nature should be in order every day. Briefly, the Island Camp should never become a hotel, but remain a camp, pure and simple, where Club members may find rest and live as close to nature as possible.

Much might be written concerning the attractions of Three Mile Island and the region of Lake Winnepesaukee. The beautiful views, from the various points, of Belknap, Copple Crown, Ossipee, and Chocorua, must be seen in order to be appreciated. The rocky glen at the bathing beach, the narrow strait which separates the little Rock Island from the bluff on Three Mile, the ledges projecting into the water at the northern end, are among the many points of interest. The island is now covered with a second growth of poplar and birch, with many oaks and maples, and a few pines and evergreens. Among the rarer trees discovered are two tupelos. The botanists are making a list of the flora, which we shall expect to publish. To them the little swamp at the northern end offers special attractions.

Many are the delightful excursions upon the lake, that to Green's Basin being the most charming. Over a foreground of water and bog we see, not far away, the forest slopes of Ossipee and Red Hill, while between them in the distance show the peaks of the Sandwich Range. Red Hill can be ascended in a short day; Belknap takes longer, but is easily accessible; while Copple Crown and Shaw's Peak in the Ossipee Range are



MT. CHOCORUA FROM THREE MILE ISLAND.

From a photograph by E. L. Homer.

possible in a long day for good walkers. Interesting carriage rides can be taken to various points, including the Whittier Pine, Squam Lake, and Diamond Ledge in Sandwich. Undoubtedly there are attractions enough to last for many years, while the island itself will fascinate all who love nature and enjoy life in the open air.

The Recent Fatalities on Mt. Washington.

REPORT OF THE COMMITTEE OF INVESTIGATION.

Presented January 2, 1901.

NEAR the time of assembling at the Summit House of the 35th field meeting of this Club, Messrs. William B. Curtis, of New York, and Allan Ormsbee, of Brooklyn, perished in a storm while climbing Mt. Washington to be present at that meeting. The former was a member of the Club. This committee was appointed at the field meeting to make, finally, a more deliberate report upon the disaster than was possible then.

Mr. Curtis was known as the father of athletics in America, and was looked upon as an authority. He founded the Fresh Air Club and the New York Athletic Club. Years ago he was one of the finest amateur athletes in this country. More recently he took up mountain climbing and cross-country walking. He would make long jaunts at a rapid pace. A man of splendid physique, nothing daunted him; he would climb alone and in all kinds of weather, thinly clad. He kept up his outdoor exercise all winter. He had previously travelled the very path they took up the mountain. On the other hand, he had pneumonia in 1892 or 1893, and strained a knee in 1899. His age was sixty-three years.

Mr. Ormsbee, a member of the Crescent Athletic Club, of Brooklyn, N. Y., was in the prime of vigorous youth (twenty-eight years), just the man to stand by a companion in distress. In company with Mr. F. D. Ilgen they spent several days in ascents of Lafayette, Whiteface, Passaconaway, Sandwich Dome, and Tecumseh. On the day which proved fatal to his friends, Mr. Ilgen climbed the Twin Mountain range and proceeded to Mt. Washington by rail.

Some of the storms which visit New England develop features among the higher White Mountains which are peculiar. Above the natural timber line, where the wind frequently becomes too high for a man to stand against it, the rocks assume a temperature at once below the freezing point of water and below the dew point of the air blowing against them. There may be rain, or hail, or snow. If there be rain, it freezes in a glassy coating.

The conspicuous and unique feature, however, is a copious deposit of white frost. Long feathery crystals, opaque horizontal icicles, white fingers pointing toward the wind, grow upon every exposed surface, breaking off sometimes as the wind veers, and then collecting like driven snow in the hollows. Telegraph poles become columns thickened toward the wind, and wires look like ribbons. Everything is slippery to the foot, pathways get covered up, and landmarks are made unfamiliar.

A dense fog limits the vision to a very few yards, even at noon, and brings on darkness before the end of the day. If one tries to walk, the wind may make him step in the wrong place; or, bracing himself against the wind just as it suddenly stops, he may fall toward it. One can hardly keep his breath; violent efforts cause unexpected exhaustion.

Such storms are not unusual after the middle of August, but are very improbable in early summer. Experienced guides rarely venture to face them.

The storm we are considering began with surprisingly high winds in the valleys Friday night, June 29, and raged at the summit through Saturday and Sunday. If Messrs. Curtis and Ormsbee had called Saturday forenoon at the Crawford House, they undoubtedly would have been warned not to try the ascent, for that is the custom of the hotel in such cases.

They spent the preceding night at Rosebrook Inn, near the Twin Mountain House, and left in the morning, with the intention of going to Mt. Willard first. Men answering to their description were seen by a teamster, H. J. Norris, to start up the bridle-path somewhat before ten o'clock, or else about noon. They exchanged words as to where the path starts. The name "Crawford bridle-path" is a survival from the time when the mountain was ascended on horseback. "Crawford path" is an abbreviation frequently used now. The path is about nine miles long (fourteen kilometres and more).

A walk of three and a quarter miles from the Crawford House carries the climber out of the forest at an elevation of about 4300 feet (a little more than 1300 metres) above the sea, where a side trail through the dwarf fir leads in about 150 yards to the bare summit of Mt. Clinton. Here is a weather-proof canister, kept there by this Club, and upon its roll the names of our two climbers were duly entered, with the date.

A short three quarters of a mile more, with gentle descent over open ledges, carries one across the col to the base of the dome of Mt. Pleasant and into the high "scrub" again. Here the more evident path leads around the southern side, and upon it, on Saturday, were two Crawford House workmen cutting out the growth which had encroached upon the pathway.

About 1.30 o'clock one of them, James C. Harvey, seeing Messrs. Curtis and Ormsbee as they went up the dome, started after them and shouted, but did not succeed in overtaking nor in stopping them. Harvey reports that the wind was blowing a "terrible gale," with fog and snow, and that it was very cold.

A little after two o'clock, Harvey having returned to work with his companion, Smith, two residents of Bartlett passed down the path.

At three o'clock Harvey and Smith were forced by the storm to quit work and go down.

The Bartlett men, Charles Allen and Walter Parker, had been employed to care for a small party, camping in the woods south of Mt. Washington, and making their way without a path up the Montalban ridge and over Boott spur.

Allen reports that Friday night was cold and windy; that Saturday morning was very cold, and there was a high wind which was very troublesome in unsheltered places; that he saw trees which had been uprooted by the wind that day; that the sky was clear during the early hours, but heavy clouds concealed the summit of Mt. Washington; that rain began to fall about half past eleven o'clock, coming in fierce squalls; that across Bigelow's lawn (above the head of Tuckerman's ravine) the wind was blowing a hurricane, so that the walkers had to stop every few minutes, lying flat or using the lee of rocks to rest and take breath; that "the storm was terribly severe, and it seemed as if the hail would take the hide off;" that all the

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party were trembling with cold; that on reaching the Crawford path (near the foot of the cone of Mt. Washington) about one o'clock in the afternoon, it was both raining and hailing, although there was no ice upon the rocks, and the wind was so strong it was about impossible to keep on the feet.

Here that party had ventured to divide, a risky proceeding for either half, but happily without serious results. The Rev. H. P. Nichols and his son had turned up the path, with difficulty reaching the Summit House on Mt. Washington at two o'clock.

The Bartlett men, going down, had met and passed Messrs. Curtis and Ormsbee shortly before getting to Harvey and Smith. Consequently, if it was after the climbers had crossed the col between Pleasant and Franklin, it was before they had gone far on Franklin, that is, about five miles from the Crawford House.

On passing Harvey and Smith, the Bartlett man reported the meeting, and stated that both the climbers were very cold. Allen tells us that after Parker, who was ahead, had exchanged salutations with Messrs. Curtis and Ormsbee, he (Allen) said to the latter:—

“How are you?”

“Hullo!” was the only response.

Allen then said:—

“It's awfully rough; you'd better go back; it was all we could do to get down; I don't believe you can ever get there.”

Neither man made any reply. The pause was only for a moment or two on account of the severity of the storm. The two pairs of walkers respectively kept their opposite courses. Allen noticed Mr. Ormsbee's camera and the thinness of Mr. Curtis's clothing. He thinks it was about two o'clock. He reports passing the Crawford House workmen soon afterward, noticing the time, and hearing their story.

Of course our climbers were strangers to these men, but we have used their names in the narrative because everything here harmonizes so perfectly.

Thus the climbers were seen both before and after they passed over the dome of Mt. Pleasant (about 4500 feet above sea), where, in addition to the date and their names in the

record canister, is the entry: "Rain clouds and wind sixty miles — Cold."

They were not again seen alive. On Monday their cameras, some bread, and a bottle, which had held milk, were found farther on, under the lee of the larger of the summits of Mt. Monroe, where a sort of shelter had been extemporized, probably with the help of a jackknife; and still beyond lay their lifeless bodies.

It was about 11.15 o'clock Monday forenoon when Curtis was found. He had suffered a stunning fall. His body lay in the path about a third of a mile beyond the shelter, near the Lake of the Clouds, and before the path begins the steady ascent of the cone of Mt. Washington. Ormsbee's body was prostrate within a few hundred feet of his goal at the summit. It was found about 4.30 o'clock Monday afternoon.

Saturday was the day for the assembling of the field meeting. We have seen Messrs. Curtis and Ormsbee starting from the southwest and the Messrs. Nichols arriving from the south. T. S. and V. D. Lowe, the guides from Randolph, ascended through Tuckerman's Ravine, went directly up the south-southeast side of the cone, and reached the summit about half an hour later than did the Messrs. Nichols. Even these hardy mountaineers found it very difficult work. The experienced driver of a four-horse coach, which succeeded in getting up the carriage road (on the sheltered side of the mountain) weighted the right hand side of his vehicle with large stones. At the end of the afternoon the main party of the Club arrived at the summit by railroad with their baggage. In the party were two friends of the missing men, who vainly tried by telephone to get tidings of them. In the evening, the Chairman of the Field Meeting Committee persuaded the guides to try whether they could go down the cone to find them if there. A few steps were enough to prove that it was impossible: indeed their lanterns were at once blown out. The Summit House was cut off from the rest of the world. Any attempt at rescue being out of the question, comfort was taken in the thought that if the climbers had started, they must have turned back, having received full warning from the Bartlett men.

The experiences of the storm at the summit (where the tem-

perature fell to twenty-five degrees Fahrenheit as early as Saturday morning), the quest for the missing men, the finding of Curtis's body by Mr. L. F. Cutter, and of Ormsbee's by Professor H. C. Parker (both Club members), and other interesting details, which do not prove vital to our present report, are ably told in the daily newspaper, *Among the Clouds*, printed upon the summit of Mount Washington. The event enlisted the aid of many willing hands, and received earnest consideration by the Club party, as there acknowledged and reported. Considering that the several issues of the paper can be procured, our report has not been swelled by including these things. Thanks are due to the Field Meeting Committee and to the editorial staff of the paper for the care with which the facts were set forth, and to the proprietor of the paper, Mr. F. H. Burt, for permission to use the data. Mr. Cutter, Professor Parker, and Mr. Mathewson have also aided the Committee.

Let us return to the point east of Mount Pleasant where the Bartlett men passed the climbers. Northeast is nearly the average direction from here to the cone of Mount Washington. A short walk with moderate rise carries one by the highest point of Franklin; but the path comes out of the high scrub and reaches a broad level, nearly as high and quite bare, commonly known as Mount Franklin. All effective sheltering growth is now at an end. Perhaps the climbers passed in the vicinity of half past two o'clock. Then there is a distance of nearly a mile with a slight rise in the aggregate to where the shelter, and the bottle, bread, and cameras were found.

How long did it take them to traverse this scant mile? The distance, the elevation above the sea, and the character of the walking are very similar to the walk northward across Bigelow's lawn, which the Nichols party traveled three hours earlier in the day, but with loads and with wind in their faces. In the Rev. Mr. Nichols's words:—

By alternate rushings and crouchings Bigelow's lawn was covered in two hours.

The distance, remember, was but little over a mile.

Coming out of the woods to the Spur, I took the lead myself. The packers were frightened at the force of the wind. The change from

the shelter and sunshine of the woods, with but a suggestion of wind and cloud that acted as inspiration, to the open spur, wind-swept and fog-swathed, was appalling. In an instant we were grappling with a terrible foe, the only possible escape retreat. To stand upright was impossible from the very moment we came out of the woods upon the rocks. Even to move forward at all, save between the gusts, was out of the question. The wind bearing its burden of sleet could not be faced; progress must be by tacking. We reached a small guide-post in the chaos of rocks, pointing down to the Crawford House and up to the summit. Our packers here left us, with mutual misgivings, yet by previous arrangement.

In contrast with this speed of hardly over half a mile per hour, the packers, now free from loads, with the wind no longer in their faces, and with a down grade in their favor, travelled from the sign-post to the col west of Franklin in about an hour, surprisingly fast under the circumstances. But remember, that in neither of the cases was the wind so high, as later, when our climbers covered their distance with the wind on the left and in front. Rather complex relative conditions, these, to allow for.

Beyond 2.30 o'clock and the end of the high scrub on Franklin conjecture evidently would have to be relied on were a definite account of what happened to Curtis and Ormsbee required. Could they have reached the shelter by three o'clock, or was it well after four? Were they then still fresh, or had the last mile told upon them? Had any accident occurred? Where, if at all, did they halt for luncheon, and how did it affect their travelling times? Why did they stop under the lee of the Monroe summits to make the little shelter? Some of the scrub to the south of the path was cut with a sharp instrument. The men apparently crawled into the scrub for shelter, and had worn all the moss from the earth. It is at a point where the ground slopes sharply from the path and is densely overgrown with scrub, just enough space being left to crawl underneath. Once in it, partial shelter was afforded on all sides but one, and branches had been hastily broken off and laid over the exposed side. The bread and Mr. Curtis's camera were found in the shelter, the bottle and Mr. Ormsbee's camera in the path opposite the shelter. We can see no important significance in these positions — nothing conclusive as to this investigation.

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There was a contusion on Mr. Curtis's left temple. Mr. C. F. Mathewson has written a statement concerning the ground where he lay:—

Mr. Curtis's body was evidently found substantially where he fell, for it would have been impossible for Ormsbee to move so heavy a man any distance, even had there been any object in so doing.

The bare possibility that Mr. Curtis regained consciousness and finally walked beyond the place where he fell is here overlooked or excluded.

Where Curtis's feet lay the path is trough-shaped, two rocks forming the sides of the trough in such a way that it would be natural to spread the feet, and walk through it, bracing a foot out on either side. Just beyond this trough at the left, as one is going up the mountain, is a long rock rising, upon which one slipping in the trough might easily fall forward. It is quite conceivable that Curtis slipped and plunged forward, striking his head on the rock beyond. His body was found in the position which it would have occupied had the accident occurred in this manner. The other feasible conjecture is that he had a sudden attack of heart failure. The latter supposition is less likely, from the fact stated by Dr. G. S. Gove, who viewed the bodies and gave the certificate, that death did not occur for a considerable time after that injury, the blood having settled under the skin in a way to indicate that the circulatory system had continued in operation.

On the other hand, Professor Parker writes: "The position of Mr. Curtis indicated clearly that he had fallen from exhaustion." He truly adds: "With so little positive knowledge it is not likely that any theory will be accepted as conclusive." From the evidence, all considered, as to how the head was found lying, we are unable to draw any conclusion.

From where Mr. Curtis was found it is about a mile in an air line up the final cone. Part way up the path bends suddenly to the left, and even descends a trifle: moreover, where the mountain proved too steep for horses, zig-zags were made. So the distance by path is about a mile and a half. It is not probable, under the circumstances, that a stranger to the ground (as Mr. Ormsbee was) would have found the path where it turns so far out of its course. There is good reason to suppose that he went straight up among the sharp rocks — rocks such as cover

most of the cone — a supposition successfully relied upon in the search for him. Now Mr. Nichols's narrative again helps us : —

We took the packs on our own hitherto unladen backs and started to mount the cone. The real struggle now began. Before, it had been level : now, it was persistently up and among tremendous rocks. The wind increased in force. It blew us over on the sharp rocks. It blew the breath out of our bodies. Our progress was by a series of dashes — a few rods, then a rest, then a dash again for shelter. The rest must be but for a moment, lest the fatal chilliness come on. I could feel it creeping over me, I could see it in my boy's chattering teeth. The fog had become sleet, cutting like a knife : it gathered on the rocks : every step meant danger of a slip, a fall, a jagged cut. Whether the wind, or the sleet, or the ice under foot, were the greatest element of danger is hard to say. I lost my hat, though it was tied down : my alert boy found it : he shouted its safety to me from three feet away, but I heard nothing save the howling wind.

To picture the conditions during Mr. Ormsbee's struggle we have to increase the force of the wind and probably to remove the remaining daylight. Fully fifty heavy bruises were found upon his body, but there were no broken bones. Of the fortitude of his effort to reach the Summit House there can be no doubt ; but one must see the rough rocks and witness a similar storm in order to understand the bravery, determination, and endurance displayed.

The ascertained facts do not warrant the committee in putting forth any theory as to what happened, nor is it desirable to give the arguments by which differing hypotheses have been supported. Probably the climbers were in fairly good condition on Mt. Pleasant ; evidently they had not been incapacitated by their greatly chilled state when they began the ascent of Franklin. But, to repeat, why did they stop to make a shelter with inadequate tools — one which could hardly have been expected to protect them effectually ? It would be important to decide, if we could, whether it was or was not made necessary by the exhausted or maimed condition of one of the climbers. If not thus needed, it matters little whether the men waited to eat, or because both needed to rest ; or whether they expected to stay there until there was better opportunity to proceed, but found the conditions unendurable and pushed on. If Mr.

Curtis was maimed or exhausted, perhaps he was left at the shelter while Mr. Ormsbee started for help. Any supposition is met by a difficulty; the difficulty here is that he would need to have been so badly used up as to prevent a judicious retreat into the woods of Mt. Clinton, where his companion safely could have left him while descending for help.

There has been intense desire to know where the two separated, and how they came to do so. Unless the shelter was needed to leave Mr. Curtis in, a good cause for the separation must be found further on, for it is unanimously held that they did not part company through any trivial circumstance. It was a time when every consideration called upon them to hold together so long as both could travel, and they were not the men to trifle with such dictates.

We can see now, as they evidently did not see then, that unless they could go back they ought, rather than go forward, to have turned to one side and forced their way down the steep slopes into timber. The committee hopes that this lesson will be learned by many whom its report will reach. But the instinct to go on is the natural one; and no experiences which the men had had were of a kind to teach them otherwise. Mr. Nichols forcibly writes:—

Coming out from the scrub into the wind, just one step back means safety; that is surely the step to take, though the way down by ravines and brook beds be long and tedious. All pushing on makes return less possible and develops new elements of danger. The only safety on finding such a wind above tree level is to turn back at once. There is always protection under the trees and a chance to work one's way out, however toilsome.

Manly words, these, from one who did not himself turn back.

Are we to believe, then, that Mr. Curtis was alone when he fell, having pushed onward after being left, perhaps, at the shelter? Or was he in company with Mr. Ormsbee, who then went forward for help? Or was the latter a step or two ahead of him, and ignorant of the accident? In view of the thick fog, of the possibility that it was already dark, of the difficulty of looking behind one in such a gale, of the relative feebleness of the human voice, and of the necessary concentration of all one's mind and strength and will upon the work of making any

progress whatever, — in view of these, we cannot quite rule out the supposition of an involuntary separation. But in allowing this possibility we do not imply heedlessness. The separation having occurred, Mr. Ormsbee could only have gone ahead.

The supposition that there was a separation previous to Mr. Curtis's fall is connected with the idea that the shelter was due to some earlier disabling, and was made to protect him until assistance should arrive; it opens the possibility of a long interval before he started onward and fell. The other suggestions as to the purpose of the shelter allow the climbers to move together to where Mr. Curtis fell, whether that mishap was, or was not, known to Mr. Ormsbee. They point to the end of the afternoon of Saturday, the thirtieth of June, as the time of the accident to Mr. Curtis. The question whether Mr. Ormsbee knew of the fall and then started for assistance, or got ahead unawares by reason of it, does not hang upon an understanding of the purpose of the shelter.

We will restate the three hypotheses which confront us at the most important point: —

First, that Mr. Curtis was left more or less disabled at the shelter while Mr. Ormsbee went for help, Curtis subsequently going to the place where he was found, and that he was alone when he fell.

Second, that Mr. Ormsbee was with him when he fell, and then went for help.

Third, that Mr. Curtis, a few steps in the rear, fell without Mr. Ormsbee's knowledge, and that the accident could cause the separation without carelessness.

This report has lessons to teach. Provide adequate clothing. Even if experienced and strong, turn back rather than face such a storm. If inexperienced, do not let bright skies and an open pathway lure you to where you may need resources not at hand, and do not go alone. Hold together. Watch, to foresee the conditions ahead of you. Do not exhaust yourselves by wasteful hurry and needless continuousness of severe effort. Keep courage; resist the fatal desire to lie down.

Vyron D. Lowe's experience and parental training as a mountain guide give his opinion great weight: he attributes these deaths to the rapid and continuous increase in the violence of the

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storm, to insufficient clothing, and to an eager pushing on, instead of either giving way a little in order to husband the strength, or else turning back. Mr. Nichols writes of his own experience:—

The one essential is to retain hope. To have missed the line of cairns across the Lawn, to have got out of the trail, to have left the old corral of the Bridle Path just one side, or not to have known that it was but a short distance from the Summit House — for one moment not to have known where we were, would have meant discouragement, despair, exhaustion, death.

The Committee would add that companionship gives courage. When a small party has to divide, the safety of each portion may be lessened.

It is hardly for us to dwell upon the human side of the tragedy — upon the places left vacant by the removal of these two men. The associations in which they were active have fittingly commemorated them, and memorials have been erected on the ground. In the words of another, Mr. Ormsbee's heroic death has endeared him the more to his friends, while Mr. Curtis, who had shown some signs of the effects of advancing years, died as he had wished he might — on a mountain.

ALBION A. PERRY,	} Committee.
JOHN RITCHIE, JR.,	
J. RAYNER EDMONDS,	

The Panoramas from Ram's Head and Prospect Hills.

BY EDWARD G. CHAMBERLAIN.

THE panoramas from Ram's Head and Prospect Hills sent forth with this number of APPALACHIA are not based on photographs, and, intentionally, are not even accurate sketches of the views. They are intended as *guides* to the views, and are purposely distorted in order the better to enable visitors to identify the points shown. They are in a measure encyclopedias of the views, giving the bearings, distances, and general appearance of the objects, and usually the latitudes of the mountains are also given. All objects are placed in their true bearings or azimuths, the degrees being numbered from 0 to 360, beginning at true

south. The vertical scale is roughly twice the horizontal, but on a sliding basis, the vertical angles between distant points being exaggerated and those in the foreground being shortened.

The reason is the following: Two distant objects, seen one beyond the other a mile apart, would appear on a photograph of this size as combined in a single dot, and probably would not be visible to the naked eye though separable in a field-glass or telescope. So, assuming that those who wish to study the distant view will be provided with proper glasses, this distortion has been made for their benefit. Moreover, distant objects, such as buildings, have been shown magnified, so as to indicate to some extent their shape and appearance in the glass, and thus assist in their identification. Visitors without glasses may assume that the air is too hazy for a view of these distant objects, and too often this is the truth.

The method of construction of these profiles may be of interest. The true bearings of the various objects having been observed or computed, a skeleton chart was made with a horizontal skyline and vertical lines one centimetre apart for the 360° of azimuth. Several free-hand sketches had already been made of the views at different times under different conditions of atmosphere and illumination. These were adjusted to each other, and to the chart by the known points which had been placed thereon in their proper angles. The published profiles are about one fourth of the original scale.

The Prospect Hill guide is the result of many visits on the best observing days in a long series of years. On the earlier visits the contradictory identifications¹ by visitors and the resulting discussions led to a systematic study of the view, Prospect, Blue,² and Holt Hills being to some extent worked together as bases for a triangulation. The then almost unknown mountains of southern New Hampshire were thus located and their heights determined by the writer. The positions of many points were gathered from the Borden Survey of Massachusetts, 1831-1840, and from other sources, and their bearings from Prospect computed. The list finally included about everything in New England that there was any hope of seeing, or that

¹ See APPALACHIA, Vol. IV. p. 141.

² See APPALACHIA, Vol. III. p. 122.

enthusiastic friends claimed to have seen. All these objects were carefully searched for from Prospect by turning the telescope to their proper angles. Three queries were made in each case: Is the angle correct? Is the description correct? Is there any similar object nearly in line that might be mistaken for it? Very few points have been picked up accidentally. Several are omitted as not answering yet all three of the tests named. New points are made out occasionally, and two villages, searched for in vain for thirty years, have been seen since the profile was printed, thanks to favorable illumination.

When General Lawrence instructed the writer to study the view from his new tower on Ram's Head Hill, the same method was adopted, though of course a large body of work done on Prospect and other hills became instantly available. The first operation was to determine the latitude, longitude, and altitude, by triangulation. Then the bearings of all objects likely to be seen were computed and the objects searched for. This might seem unnecessary after points have become so well known, but the writer has frequently found himself mistaken even with the most familiar objects, being undeceived only on reading the angles. As at Prospect, some objects are omitted as not fully identified, — and future visits will undoubtedly reveal others, as favorable conditions are encountered.

Bibliography.

A PRIMER OF FORESTRY, Part I: The Forest. By Gifford Pinchot, Forester, Department of Agriculture. Washington: Government Printing Office. 1899. Ed. 2, 1900. 12°, 88 pp., numerous illustrations. Price, 50 cents.

The object of forestry, as stated in this primer, is "to discover and apply the principles according to which forests are best managed. It is distinct from arboriculture, which deals with individual trees." It includes any intelligent management of a forest regardless of the object in view; but, although the management of forests for the sake of their appearance lies thus within its scope, its primary object is usually material profit.

The methods of practical forestry, which depend upon a close knowledge of forest conditions, are to be treated in Part II., now in course of preparation, while the forest itself is described in the present publication. It is a brief, clear description of the materials and the conditions with which the practical forester has to deal, written from the point of view of the forester and forming a groundwork for the instruction of methods of practical forestry to be contained in the second part.

As becomes the title of the book, it takes nothing for granted except reasonable intelligence on the part of the reader. It begins with an excellent statement of

the life of a tree; its parts and their functions, its feeding, breathing, and transpiration, its manner of growth, and the structure of its wood. The distinction between the dead skeleton of heart-wood and the living flesh of sapwood, the growth in diameter by the annual formation over all the tree just beneath the bark of a layer of sapwood cells that remain ever after fixed in size and position, and the growth in length solely by the elongation of the twigs of the current year, are not only well described but are illustrated by diagrams and half-tone illustrations from actual logs. The physiological need for ground-water, light, and air is briefly explained.

It may not be amiss here to call attention to the statements sometimes put forth by misinformed tree lovers as to the direct sanatory value of the absorption of carbonic acid gas and emission of oxygen by the trees planted in our streets and about our houses. A shade-tree in vigorous growth increases in volume of trunk and branches not over five cubic feet a year, at a liberal estimate. In doing so, it forms not over two hundred pounds of woody matter (exclusive of water), of which amount about one hundred pounds would be carbon withdrawn from the air. From an adjacent house at least ten or fifteen tons of carbon is likely to pass into the air during this same time in the form of carbonic acid gas from the consumption of coal, wood, and gas or oil, regardless of that given out by the people and domestic animals. The immediate local value of a few trees in removing carbonic acid gas from the air is therefore very slight as compared with the action of the atmosphere itself in diluting the gas and distributing it by means of the wind. The direct sanatory value of trees lies far more in the obvious effect of their shade upon temperature and evaporation, and in the inestimably refreshing effect of their appearance.

The second chapter of the primer deals with the behavior of trees in the forest, the silvicultural character or special requirements of the various sorts of trees. No attempt is made to set forth the complete silvicultural character of any species, but the requirements of most importance are studied with a view to their effect on the distribution of the trees and their success in the struggle of forest life. Of the greatest importance to the forester is a knowledge of the requirement of different trees for light, which gives rise to his classification of trees into those "tolerant" and those "intolerant" of shade. By regulating his cutting of the trees whose foliage forms the forest "cover," the forester can control the conditions of light far more readily than he can usually modify the conditions of moisture, while temperature is practically beyond his control, although he must always bear in mind its effect upon his plans.

Other factors in the behavior of various trees in the community of the forest are their comparative rates of growth at various ages and their methods of reproduction. The relation of these factors to the life of a forest as a community of trees is set forth in a clear and interesting manner in chapter three, by describing the progress of a forest through the seven ages of its trees, from seedlings, through small saplings and large saplings, small poles, large poles, and standards, to veterans over two feet in diameter, and to their gradual decay. The text and numerous illustrations show how the trees give each other mutual help and support, while at the same time engaged in a life and death struggle for survival; how each contributes its share to the improvement of the forest conditions, and then the weaker are suppressed or exterminated by the stronger; how, at different stages of the forest's life, different qualities give success to the victors; and how the forest comes to be made up of trees of many sizes, old veterans, young trees that have sprung up to take the place of fallen veterans, and other trees as old as their betters but starved or shaded into long submission, some kinds like the spruce ready to grow vigorously when their oppressors fall, other kinds lingering without hope of rejuvenation.

A chapter follows upon forest enemies, of which the greatest are fire and destructive lumbering.

Except by inference this Part I. of the primer will give very little definite idea of what forestry is. Its object is to point out those things which the forester must know about the forest before he goes to work. In this it succeeds admirably, and he who reads it will be helped to a clearer and deeper understanding of the woods as active, changing, developing communities of living beings. To his practical skill in dealing with the woods it will add only if he has ability to apply this broader understanding, or if he follows it by study of the methods of practical forestry to be treated in Part II. To his direct enjoyment of the visual beauty of the woods it may not add at all, but it should give them a deep and dramatic interest by opening his eyes to the unending contest for existence and survival. Perhaps nowhere can this drama of nature be more readily appreciated than among the trees of the forest, for, unlike shy animals, they carry on their quiet struggle undisturbed by man's approach. F. L. O.

SOME POPULAR WORKS ON FORESTRY.

What is Forestry? Bulletin No. 5, Division of Forestry. By B. E. Fernow. Washington, D. C.: Published by United States Department of Agriculture.

Work of the Division of Forestry for the Farmer. By Gifford Pinchot. Washington, D. C.: United States Department of Agriculture.

The Practice of Forestry by Private Owners. By Henry S. Graves. Washington, D. C.: United States Department of Agriculture.

Forestry for Farmers. Farmers' Bulletin No. 67. By B. E. Fernow. Washington, D. C.: United States Department of Agriculture.

The Relation of Forests to Farms. By B. E. Fernow. Washington, D. C.: United States Department of Agriculture.

Tree Planting in the Western Plains. By Charles A. Keffer. Washington, D. C.: United States Department of Agriculture.

Tree Planting in the Waste Places on the Farm. By Charles A. Keffer. Washington, D. C.: United States Department of Agriculture.

Practical Tree Planting in Operation. Bulletin No. 27, Division of Forestry. By J. W. Toumey. Washington, D. C.: United States Department of Agriculture.

Trees of the United States Important in Forestry. By George B. Sudworth. Washington, D. C.: United States Department of Agriculture.

Forest Influences. Bulletin No. 7, Division of Forestry. By B. E. Fernow, M. W. Harrington, Cleveland Abbe, and George E. Curtis. Washington, D. C.: United States Department of Agriculture.

Notes on Some Forest Problems. By Gifford Pinchot. Washington, D. C.: United States Department of Agriculture.

Measuring the Forest Crop. Bulletin No. 20, Division of Forestry. By A. K. Mlodziansky. Washington, D. C.: United States Department of Agriculture.

The White Pine. Bulletin No. 22, Division of Forestry. By V. M. Spalding, revised and enlarged by B. E. Fernow, with contributions by F. H. Chittenden and Filibert Roth. Washington, D. C.: United States Department of Agriculture.

United States Geological Survey, Nineteenth Annual Report, Part V., also Twentieth Annual Report, Part V., with atlases. The Federal Forest Reserves. Washington, D. C.: United States Department of Interior.

The Trees and Shrubs of Massachusetts. By George B. Emerson. Originally published by the Commonwealth of Massachusetts. Boston: Little, Brown & Co.

The Silva of North America. By Charles S. Sargent. Boston: Houghton, Mifflin & Co.

Few of these works are, strictly speaking, publications of the day, but they are classics, and therefore good for all time or nearly so. The first twelve publications mentioned are government pamphlets issued within the past ten years, and are worthy of being gathered together in one set of covers. The remaining four stand by themselves as monuments to our state and national timber resources.

Since our Club has seen fit to establish this year a department of forestry, it must be assumed that there are many of our members who take an interest in this subject, and this must be the excuse (if any is needed) for the presentation here of this list of books and pamphlets. Forestry as an applied science is comparatively new to this country, and largely for that reason there are no works upon the subject applicable to American forest conditions other than those issued by the federal government. Even these are elementary in character, which, indeed, is one of their chief points of value, since they are capable of comprehension by the veriest tyro. These publications of the Division of Forestry of the United States Department of Agriculture have been, in fact, largely instrumental in inaugurating so much of a forest policy as we have to-day. They showed the sceptical farmer and lumberman that "forestry" was not the watchword of a lot of sentimentalists and alarmists. They showed it to be the name of an applied and approved science capable of commercial exploitation, until at length lumbermen and timberland owners saw the wisdom of the reasoning, and some were actually induced to practise forestry in place of the old-fashioned wasteful logging.

This tendency on the part of owners and operators was given a further impetus by the liberal offer made by the Division of Forestry in 1898, by which it became possible for timberland owners to secure the advisory services of the Government's foresters at a nominal cost. Up to September, 1900, applications had been received representing nearly two and a half million acres of private owned forest, and in addition to this the New York State Forest Reserve and the Federal Forest Reserves have been placed under the Division, so far as working plans are concerned. The Division has done a similar work in planning plantations of timber trees on farms in the treeless plains and elsewhere.

All this is history and not strictly a review of the works in hand, and yet it shows their worth, since through their agency much of this history has been created. Broadly speaking, governmental policy, law, and private effort are all based upon public sentiment and demand. If we are to hope for the rapid advancement and more general adoption of scientific forestry in this country, we must endeavor to strengthen the public sentiment in favor of that object. It is through the study of such works as we have here enumerated that the subject will be best understood by laymen and operators. Thus informed, we shall be able to engage intelligently in the extension of the propaganda.

Dr. Fernow's pamphlet, entitled "What is Forestry?" and his other pamphlet called "Forestry for Farmers," should be read in connection with Mr. Pinchot's "A Primer of Forestry, Part I," which is separately reviewed in this magazine. All are available government publications, and the lay student, the owner of a farm wood-lot, or the lumberman will find in them a full and readily comprehended exposition of the practical side of the subject. The interested reader desirous of going a little more deeply into the subject will find in the pamphlet on "Forest Influences" several carefully written chapters on the relation of forests to climate and water supply, some notes on the sanitary significance of forests, and a scholarly summary of conclusions.

The general reader will also find interest in Mr. Pinchot's "Notes on Some Forest Problems," in which are treated the true character of forestry, a synopsis

of our governmental forest work to-day, the effect of taxes on conservative lumbering, effect of grazing on forest lands, results of tree-planting on the plains, and the effect of fires. The farmer and timberland owner will find profit in the "Work of the Division of Forestry for the Farmer," wherein the coöperative advisory system is described. "The Practice of Forestry by Private Owners" is, as the title fully explains, a brief description of the methods employed on large and small holdings in various parts of the country, and deals with planting, thinning, pruning, and fire-fighting. "The Relation of Forests to Farms," with its illustrations, shows the disastrous effect of clean cutting on side-hill lots, and sets forth the way in which the wood-lot may be made to serve the cultivated areas. The pamphlet on "Measuring the Forest Crop" is of value to owners of woodland, as it gives various methods for computing the stand of timber in board feet, together with tables and illustrative examples.

Mr. Sudworth's pamphlet on "Trees of the United States Important in Forestry" will be found of especial value to those who contemplate establishing plantations. It contains a catalogue of one hundred species of native trees selected from a list of some four hundred and fifty, its object being to acquaint the planter with the character and distribution of those species which with present knowledge may be considered of greatest forestal value. The list gives the common and botanical name of the species, the regions of abundant growth, characteristics and uses of the wood, soil, and climate, and characteristics of growth.

This completes the list of works on the science of forestry, and brings us to a consideration of the remaining books which relate more properly to a description of our resources. The monograph entitled "The White Pine" is a natural link between the two sets of works. This admirable work deals with the geographical distribution of this species, its relation to the lumber industry, a summary of original stand and present supplies, a botanical description of the tree and its parts, its growth and development, its dangers and diseases, its insect enemies, methods of forest management, the uses of its wood. Fully illustrated with numerous photo-engravings, colored maps, drawings, and tables, it contains practically all the information that the student or culturist could desire.

Since President Cleveland set aside the first United States forest reserve in February, 1897, public interest in our governmental forest policy has been steadily growing. In a general way we know that new reserves have been established by each administration, but there is little popular knowledge as to the number of these reservations, their location, extent, or character. All this is given in the Nineteenth and Twentieth Annual Reports of the United States Geological Survey, which has been charged with the mapping and description of these domains, and they are of greatest interest to all who find pleasure or profit in the study of our natural resources.

The last two works named in the list are essentially botanical text-books, and are given here simply because they are the best extant. Both are well known to every student of arboriculture, and require no further review here. A. C.

GLACIÈRES OR FREEZING CAVERNS. By our fellow-member, Edwin Swift Balch. Philadelphia: Allen, Lane, & Scott. 1900. 8°, 337 pp. 30 illustrations.

One of the most important contributions to the literature of geographical science during the year 1900 was the volume, "Glacières or Freezing Caverns," by Edwin Swift Balch. The book is interesting to our Club, since it treats of caves, which are mountains reversed, while to the world in general it is valuable, since it is only the second volume in our language which is devoted to these remarkable phenomena.

A *glacière*, or ice cave, is a cavern within which ice can be found at times other than the cold season of the year. These ice caves should not be confused with the so-called "ice caves" of Switzerland, which are merely caverns melted out in the ice at the end of a glacier, and from which a glacial river usually issues. Accounts of *glacières* are quite plentiful in the early memoirs of the scientific or "philosophical" academies of France more especially, and in recent times, with the spread of travel and the constantly enlarging stream of information, accounts of them have entered not a little into the stories of travellers, the essays of scientific men, and the short, popular notes of the newspapers.

One widespread claim for caves of this character which has come to us from the earliest reports, and is oftentimes a part of the more modern ones, is that in them the ice forms in summer and in winter it disappears. Much of the attention of scientific men has been devoted to explaining this peculiarity; but Mr. Balch disposes of it as being contrary to fact, so far as he has been able to inform himself.

The one earlier volume on this interesting subject, that of Rev. G. F. Browne, dates from 1865. It was an account of the visits of the author to some fourteen of these caves, a résumé of facts concerning a dozen others, some chapters on hypotheses concerning the formation of the ice, the structure of the ice, and other related matters. It was an important book, not alone from the fact of its being a pioneer in a new field, but from the faithfulness with which the writer recorded his experiences. His book was a successful one, and has been a classic to the comparatively few students of ice caves.

In his additions to what was known about ice caves, Mr. Balch merits highest commendation and praise. Blessed with the means and the taste for travel, he has himself visited some fifty *glacières*, and has been able to present his own observations and not merely those of others. His work would have been an important one had it been nothing more than the accumulation of the facts. But he goes much further, and spends a great deal of time and thought in the consideration of the causes of the subterranean ice.

After due consideration of the circumstances, viewed in the light of his own extensive explorations of these caves, Mr. Balch expresses his adhesion to the "winter's cold" hypothesis. These caves are so situated and so exposed that the air in them is little disturbed and is out of reach of the sun's rays, and under these conditions the cold of winter will readily develop within them, while the environment prevents a rapid distribution of the heat of summer. Ice is therefore preserved in these natural refrigerators far into the warm season, or even, it may be, till the cold of the next winter produces more ice. He has no faith in the actual formation of ice during the summer, although the conditions permit of the freezing of water later in the year than would be possible under normal out-of-door temperatures.

Tribute should be paid to Mr. Balch for the faithfulness of his work. His story is a simple one, but it tells of conscientious research. His patient visits to *glacières*, necessitating distant travel, journeys into difficult and even dangerous localities, tell of enthusiasm in his work, while his lists and bibliographies speak for themselves. His list of *glacières* reaches nearly three hundred caves, while the best possible catalogue preceding him was less than one third as large. In the same way his list of references to these caves in periodical literature numbers two hundred titles, a remarkable exhibit on a subject so restricted.

The volume is neatly printed, beautifully illustrated, and well indexed.

J. R.

IN THE ICE WORLD OF THE HIMALAYA. By Fanny B. Workman and William H. Workman. London: T. Fisher Unwin. New York: Cassell & Co. 8°, pp. 204. 67 illustrations and 3 maps.

This recent American contribution to the world's best Alpine literature may justly be a source of pride to all lovers of mountain grandeur and believers in the peculiar virtue of this form of sport dwelling on this side of the ocean. By its theme, one of the most magnificent of the vast regions comprehended under the name Himalayas; in the graces of style, neither too prosy nor too ornate; and, best of all, in the spirit which animates it, falling far short of the cheap forthputting or even self-complacent style of persons who would be understood to have performed great things under extraordinarily trying conditions, yet plainly and sanely estimating the true character of the difficulties overcome, — in all these particulars the book leaves little to be desired to render it a healthy model for its class.

The presence of Mrs. Workman's article on "Pioneer Ascents in Baltistan" in the present number of *APPALACHIA* makes it unnecessary to enlarge upon any of these points. This article contains the substance and style of chapters VI. to XI. of the volume, and recounts the more exciting experiences of this bold mountaineering. The earlier chapters, though narrating the journeyings of Dr. and Mrs. Workman amid somewhat less awe-inspiring scenery, nevertheless lead the reader into remarkably out-of-the-way regions, to us Americans at least practically unknown. The strange people and customs interestingly set off the strange milieu.

The dependence of the explorer's success upon the coolie porters stands out in every chapter, though most in chapter IV., where, under the caption "The Shady Side of Himalayan Mountaineering," we learn how the particularly unreliable character of the coolies of Sikkim wrecked the fortunes of the Workman party, after it had set out for an exploration of the main chain about Kinchinjanga. On the whole, one receives an uncomfortable impression of the relations of these degraded members of the human family, — one thinks inevitably of the arquebuser's remark in Wallenstein's Lager, "Der Bauer ist auch ein Mensch, — so zu sagen," — of their relation, we say, to the powers that be and the powers which, by virtue of a short-term, cheap-labor contract, vainly seek to be. It is apparently not a subject alluring to a close inspection. Evidently it is one of the numerous equivocal aspects of the white man's burden, — "but that is another story!"

By no means least in interest on the purely alpinistic side are the separate testimonies of Dr. and Mrs. Workman as to the effects of rarity of the air. In general they argue for a greatly diminished susceptibility to the influence of low pressures in persons endowed with a naturally strong physique and subjecting themselves to a proper régime in diet, in particular as regards stimulants.

The profusion and beauty of the illustrations alone would make this book a valuable addition to one's library. The view of Mt. Meru (opposite p. 117) makes one long to follow with his eyes the flight of its heaven-aspiring aiguilles. We think that the magnificent "Walhall of the Biafo," which we are permitted to reproduce as one of our illustrations, gains something in its realism by being advanced from the rank of a "half-tone" to that of a photogravure. C. E. F.

THE ALPINE JOURNAL. Vol. XX. No. 151. London, February, 1901.

This latest issue of "The Alpine Journal" contains three interesting special articles: "Mountaineering in the Himalayas," by the well-known Major Bruce; "Excursions in the Graian Alps," by Mr. Alfred Holmes; and "The Dreieckenjoch," by the Editor. The first two in particular are beautifully illustrated, which leads us to comment on the vast improvement recently made by the Journal in this

important particular. Surely in no place do even the finest descriptive powers stand so much in need of pictorial reinforcement as in the narrative of exploration in grand or beautiful mountain regions. And so we may say here, without prejudice to the authors, that Dr. Collie's Nanga Parbat, Mrs. Bruce's Bhat Khol La, and Mr. Holmes's view from Ceresole are the most eloquent pages of this excellent number.

Major Bruce's paper will furnish very interesting complementary reading for those who have enjoyed the story of adventure in the superb Himalayan districts of Kashmir, from the reading of Mrs. Workman's article in the present issue of *APPALACHIA*, or better yet in her and Dr. Workman's book.

The initial article in the number has an interest for all who have watched the development of the Alpine Club idea, and in particular noted the trend of the times as regards fields of mountain exploration. This paper on "The Future of the Alpine Club," written in collaboration by two such distinguished members as Sir Martin Conway and Mr. Douglas Freshfield, opens our eyes as to the kind of thinking that is occupying the minds of those most deeply interested in the continuance of a dignified and brilliant record for this honored dean of Alpine societies. The discussion of the standard of eligibility less concerns outsiders than the question of a broadened field of interest. Of late years the leading climbers of the Club have sought far-distant fields, India, the Caucasus, Spitzbergen, New Zealand, the Canadian Rockies. The Swiss Alps, from which the society has its name, are hackneyed and in a sense outgrown. To quote from Sir Martin Conway: "By accident, not by design, the exploration of the mountains of the world has become a characteristic work of our Club, and the first record of such explorations is the noteworthy feature of our Journal. I maintain that the time has now come when this spontaneous development should be adopted as the Club policy, when the Club should frankly look beyond the Alps, and constitute itself the centre and chief home of mountain exploration in general. . . . Here is the Alpine Club's chance." Mr. Freshfield is quite as outspoken, as this quotation will show: "Another objection that may perhaps be put forward [to Sir Martin Conway's proposition] is that the bulk of our members have no interest beyond the Alps. If that be true, the sooner they learn to have wider interests the better and the happier for them, and we ought in my opinion to spare no pains to this end." The animated discussion (for the question has two sides), called out at the meeting at which this paper was read, is given at some length in the Proceedings at the end of the number, and we commend the entire subject to such as are asking whether the twentieth century will continue to find a place for mountain clubs and their special form of literature.

C. E. F.

LA GÉOGRAPHIE. Vol. I. Paris: 1900.

At the beginning of the year 1900 the Société de Géographie (Paris) established a superb magazine, *La Géographie*, which replaces the former publications of the society, the *Bulletin* and the *Comptes Rendus*. *La Géographie* is a monthly of fifty or more pages, imperial octavo in size, with faultless typography and excellent illustrations and maps. A portion of each issue is devoted to the transactions of the society, while space is afforded from time to time for the proceedings of others of the geographical societies of France. The important papers presented at the meetings all find place in the magazine, of which Baron Hulot and M. Charles Rabot are the editors, and these gentlemen exercise the functions of their position with excellent judgment and taste, besides preparing each month a résumé of the world's geography under the caption, "*Mouvement Géographique*." Baron Hulot has also prepared for the first volume an excellent review of the progress of geography for the preceding year, while Mr. Rabot contributes a special article on explorations in the Far North.

The scope of *La Géographie* is world-wide, including in its first volume articles on the countries of Europe, dealing very largely with Africa, presenting the results of recent explorations in central Asia, in Korea, and by no means neglecting America. Much space is devoted in the earlier numbers to Madagascar, one article in particular, that of General Gallieni, being illustrated by a dozen maps, which deal not alone with the cartography of this interesting land, but show its hydrography and extent of its development and pacification. Taken altogether, *La Géographie* is among the most important of the geographical publications of the world, and in its subject-matter and the manner of presenting this is entitled to the highest praise.

J. R.

ANNUAIRE DE LA SOCIÉTÉ DES TOURISTES DU DAUPHINÉ. No. XXV.

The twenty-fifth annual of the Société des Touristes du Dauphiné follows its predecessors very closely in point of value and interest. The fortunate situation of the society, with snowy mountains so close at hand, and the activity and energy of its members in investigating and exploring them, give to it an opportunity to do excellent alpine work.

Nearly a dozen important articles are included in the present *Annuaire*, which vary in their range from the top of the Grand-Paradis to the depths of the caves of the earth, and of course it is Martel and his comrades who explore the latter. His article, the account of visits to the caves of Grande-Chartreuse and Vercors, occupies about one quarter of the volume. The investigation was the fruition of a wish expressed some years since that the caves in this district might be as thoroughly explored as those of Austria and of other portions of France. He had some years ago made preliminary trips into some of the caves, but in 1899 he came prepared for more thorough investigations. His story is of the same nature as those which he has been issuing for a dozen years, a plain, straightforward narrative of facts without attempt at embellishment. The conscientiousness of his work is everywhere apparent.

The present paper deals with a dozen caves into which the author has been able to penetrate, in some of them to the distance of half a mile. He has found here subterranean lakes on which to launch his boats for researches on the farther shores, and in American folding canoes has stemmed rivers in these caves with their shallows and rapids, through great vaulted halls or tortuous tunnels. He apologizes to the public because his story may seem monotonous, but to him who appreciates the rare value of Martel's work it is quite the contrary. He is patiently gathering facts, and this in a department of investigation that is so difficult and forbidding that it has been accomplished heretofore only where there was gain in money awaiting the adventurer. He has made a living science under our own eyes from material almost totally neglected by others before his day. All honor to Martel for his energy and perseverance.

The Alpine work of the Dauphiné Society is represented by a number of papers. That which treats most directly of the home mountains is by M. René Godefroy, who discusses the summits of the Bauges. This is a group of mountains lying twenty miles to the south of Geneva, and includes half a dozen peaks of about eight or nine thousand feet. The article considers these mountains quite in detail. Other papers are "A Week in the Alps — from Grand-Paradis to the Breithorn," and "The Ascent of l'Aiguille Méridionale d'Arves," which interesting peak has at its "mauvais pas" a very sensational bit of rock climbing.

Of more technical nature is the paper by Messrs. Kilian and Flusin on the variations of the glaciers in the Alps of Dauphiny. The society itself conducted some years since an extended series of observations, and the new observations of 1899 are particularly valuable for comparison. Twenty-six glaciers have been

measured altogether; some of the measures were made as long ago as 1859. With a single exception of one growing glacier and two others, which are perhaps stationary, the glaciers of Dauphiny show to-day a marked recession, and in addition there is observable in some of them a diminution in the thickness of the ice-sheet. The glaciers have been shown to have periods of growth and of recession, and are at present receding. From all the facts in evidence it appears that the same general law produces the variations, but they are nevertheless so influenced by local causes that their movements are by no means synchronous. The paper gives much of interest to special students in the detailed measurements of the flow of the glaciers.

Other portions of this creditable *Annuaire* are devoted to the proceedings of the society, the ascents of the year, and a score or more of excellent reviews. The volume is beautifully illustrated. J. R.

LE PIOLET: Bulletin du Piolet Club. Genève, 1900.

Le Piolet is the modest organ of the Piolet Club of Geneva, taking its name from the *piolet* or ice-axe of the mountaineer. In its own columns it terms itself "the bulletin, journal being as yet too pretentious a term." It is a neatly printed octavo, appearing on the fifteenth of each month, and is a perquisite of membership in the Club. The Club itself is well established, having recently celebrated its seventh anniversary, and its venture into literary fields was well considered, since Le Piolet has but just completed the second volume of its issue.

The magazine contains many evidences of the activity of the Society in the numerous accounts of ascents, and these, by the way, not confined to Switzerland, since one of the longer articles is devoted to Illimani in South America. Other articles discuss allied topics, "Mountain Sickness," "Accidents in Climbing," "Alpine Club-huts," "Lakes of Snow-land," "The International Congress of Alpinists," and the like. Poetry is not infrequently included in the literary bill of fare, while the proceedings at the meetings, the social occasions of the Club, its feasts, and the details of its second "evening with the lantern" serve to give a view of the administration of affairs in the Club, while its "Chronique Alpine" gives a condensed statement of the individual ascents of the members. The little magazine is well illustrated. J. R.

BUTLLETÍ DEL CENTRE EXCURSIONISTA DE CATALUNYA. Barcelona.

No. 46 of this interesting publication contains a new programme for detailed study of the various sections of Catalonia. The Centre proposes to concentrate its efforts during the year on two relatively small districts, La Marina and La Berga. The former is situated on the coast to the northeast of Barcelona, and the latter lies at the foot of the Pyrenees, embracing the picturesque upper valley of the Llobregat. To supplement the information which may be obtained through its own efforts, the Centre invites all those who possess special knowledge of the topography, history, literature, customs, industries, arts, etc., etc., of these sections to communicate their information to the society. As the result of these investigations the Centre will publish an exhaustive monograph on each of the regions named. Among noteworthy articles in the issues of the past year we may mention the accounts of cave exploration in Catalonia by Font y Sagué, and a study of moon traditions by Cels Gomis. The active work of the association is recorded in articles descriptive of numerous official and private excursions, in which geography and topography go hand in hand with archaeology and history.

The public lectures on photogrammetry and on Catalan grammar, announced last year, are reported as largely attended.

The Centre now numbers seven hundred and fifty members, and has just com-

pleted the twenty-third year of its existence. Its avowed object of decentralization and the admirable methods by which it seeks to excite regional patriotism arouse our sympathy and give the Centre a unique place among kindred societies.

M. C.

BOLETIN DE LA SOCIEDAD GEOGRAFICA DE MADRID. Tomo XLII., 3. 1900.

The last quarterly issue of this exchange contains an article on "The Spanish Colonies after the Treaty of Paris, 1898," by Rafael M. de Labra. American readers will feel a special interest in this essay, because, while severe in its denunciation of the past and present attitude of the United States, it also recognizes, and very frankly, a fatal error in policy on the part of Spain. Señor de Labra points out the extent to which Spain is crippled by the loss of her American and Asiatic colonies, and urges the necessity of immediate and intelligent supervision of Spanish interests in Africa. These African possessions are, with the exception of the Canary Islands, little known on this side of the Atlantic. They include several islands south of the Canary group, the largest and richest being Fernando Po, near the coast of Guinea, about 4° north of the equator; and two widely separated sections of continental Africa. Of the latter, one, known as the Spanish Sahara, is a large barren tract on the west coast, extending from Morocco to Cape Blanco, and divided about in half by the Tropic of Cancer; the other, Spanish Guinea, is a parallelogram one hundred miles wide, nearly on the equator, and extending inland from the coast to the Congo Free State. The important fishing grounds off the Spanish Sahara, and the great fertility of the Guinea region and of the various islands, offer, in the opinion of the writer, a new outlet for Spanish enterprise and industry. Numerous articles on the African possessions, published in other issues of the Boletín, show the importance which the Geographical Society attaches to these undeveloped colonies.

M. C.

BOLETIM DE LA SOCIEDADE DE GEOGRAPHIA DE LISBOA. 17th Ser., No. 1.

The Boletim devotes the whole of its last number to a study of the "Construction of Vessels in Lisbon and Goa for the Indian Trade in the beginning of the Seventeenth Century." The writer, Captain Christiano Barcellos, has brought to light some curious documents on the subject, through his researches in the archives of the Portuguese Indian Office. The problem discussed in these seventeenth-century papers is the best method of constructing vessels which may serve at once for commerce and for war. These contemporaneous studies of the old four-deckers have a quaint interest for modern readers, and an undoubted value as contributions to naval archaeology.

M. C.

Report of the Recording Secretary for 1900.

ON January 1, 1901, the corporate membership of the Club was 1166. The losses during 1900 amounting to 84 and the accessions to 157, and 3 memberships having been revived, the net gain for the year was 76. The Honorary Members numbered 20, no change having taken place during the year. The Corresponding Members numbered 50, J. Norman Collie and Walter D. Wilcox having been added, and William Williams

having failed to accept. There were 149 Life Members. The total membership was 1236.

There were held during the year nine regular and six special meetings, and two sessions during the field meeting. The average attendance has been 180, twenty-five in excess of last year. Room 22 in Walker Building has been large enough except on two occasions. Twice we have met in Room 35, number 22 being engaged for Lowell lectures.

At the various meetings there were presented, besides reports of officers and committees, twenty papers, thirteen of which were illustrated with the lantern. The White Mountains had four papers, not counting the three short ones concerning the Winnepesaukee camp. Seven New Hampshire papers remind us of the earlier days of the Club. It is also noticeable that only one paper was devoted to Canada. Maine, Washington, and Arizona had one paper each. Five dealt with countries in Europe, — England, Switzerland, Italy, and Spitzbergen, — and one with Algeria. Three were general in character.

The field meeting was held at the Summit House, Mt. Washington, N. H., June 30 to July 7. This excursion was marked by the terrible ice-storm in which two lives were lost, as recounted in the report of the committee appointed by the Club. (See page 317.) In August there was a successful camp on Three Mile Island in Lake Winnepesaukee. Accounts of these and other excursions will be found in the report of the Excursion Committee.

The Snow-shoe Section held its annual meeting in January. The membership is now 161. So little snow fell near Boston during the winter that no meets were held. The Irpn Mountain House, Jackson, N. H., was again the scene of the winter excursion, February 17 to 25. The party numbered 75.

The Alpine Section has been dissolved by vote of the Council. This action was taken after careful consideration and upon recommendation of the executive committee of the Section.

The annual social meeting was held at the Hotel Vendome, on Friday evening, February 9. Two hundred and twenty-nine tickets were sold, and a balance of \$33.30 was paid into the

treasury. Several informal receptions and reunions have been held at the Club rooms.

The bequest of Mrs. Thorndike, one thousand dollars, has been received by the treasurer, and by vote of the Club has been added to the Permanent Fund. It is to be called the "Delia D. Thorndike Fund," and its income will be devoted to those Club interests which the donor so generously supported.

The Council purchased in December a machine for addressing envelopes. The book in which the record of membership is kept is now full, and it is the intention of the Recording Secretary to substitute for it a card catalogue of members, past and present, numbering in all about three thousand. Each card will contain the name and address of a member, together with dates of membership, life membership, death, resignation or forfeiture of membership, and the names of the two members who served as nominators.

Attention is called to the reports of the various Councillors. A profile from Prospect Hill, prepared by Mr. E. G. Chamberlain, has been published, and it is hoped that others may be secured. The Councillor of Art has accomplished useful work, especially in preparing a card catalogue of photographs. The Councillor of Improvements has compiled a valuable table showing the camps and paths of the Club.

One number of *APPALACHIA* was published, Vol. IX., No. 2, in March.

Mr. and Mrs. Edson C. Eastman have added to their gift on "Three Mile Island" a tract of land measuring nearly three acres, and making over five acres in all. Arrangements have been perfected so that the whole island, about forty acres, will soon come into the possession of the Club. During the fall a building was erected upon the island, which it is expected will become the summer home of the Club. (See p. 323.)

Respectfully submitted,

ROSEWELL B. LAWRENCE,

Recording Secretary.

Report of the Corresponding Secretary for 1900.

THE Corresponding Secretary of the Club is pleased to report, as in past years, the continuance of cordial relations with many other societies of kindred purposes, and a gratifying increase in the library. The number of corresponding societies is now 118, the Piolet Club of Geneva having been added to the list since my last report. From these societies about 125 volumes have been received during the year. The sets of proceedings already on our shelves have been reinforced by the acquisition of hitherto missing volumes, among them seven early issues of the *Bulletin of the Section de la Côte d'Or et du Morvan* (C. A. F.), numbers 1 and 2 of the *Revue de la Société de Géographie de Tours*, and *Bulletin 1 of the Société des Touristes du Dauphiné*.

The appended list gives the accessions in detail. An analysis of it shows that, besides exchanges, 120 volumes have been added to the library, — 15 by purchase, 86 the gift of members of the Club, 6 by authors or publishers, and 13 from other sources, mostly anonymous. Mr. Cheever Newhall heads the list of donors with half a dozen finely illustrated volumes of travel or scenery. Mr. Edward Whymper has kindly furnished our desiderata among the volumes from his pen, having given during the year some 7 volumes and brochures. The librarian himself has brought in 11 volumes, in addition to two series of guidebooks, the Rand-McNally and the Woerl (17 pamphlets). Mr. E. S. Balch has sent to the Club his fine volume on *Glacières*, one of the two books which have been written in English on this very interesting subject, and Prince Luigi of Savoy has presented to the library the English edition of his volume on the ascent of Mount Saint Elias.

The growth of the library has been such that it has been found necessary to set up our new cases this year in the reception room. These comprise two sections of the Wernicke pattern, the beginning of a dado of such cases which in two or three years will surround and decorate the room.

The card catalogue is so well advanced that a case of fifteen drawers has been purchased for it and installed in a convenient place in the library room. In the clerical work, including the

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writing of cards and the entire care of the incoming periodicals, numbering more than a thousand a year, Miss Isabel Batchelder has continued her valuable voluntary assistance.

The use of the library is continually increasing, and other associations are finding out its value. For a number of these kindred societies, the Teachers' Geography Club, for example, the résumés of current periodical literature have been made up largely through examination of our library files.

JOHN RITCHIE, JR.,
Corresponding Secretary and Librarian.

Accessions to the Library for the Year 1900.

EXCHANGES.

AMERICAN.

- Among the Clouds.* — XXIV.
Academy of Natural Sciences (Philadelphia). — Proceedings, Oct., 1899–Aug., 1900.
Alpine Club. — *Alpine Journal*, 148–151.
American Geographical Society. — Bulletin, XXXI. 5; XXXII. 1–4.
American Museum of Natural History. — Bulletin, XI. 3; XII.; Report, 1900.
Blue Hill Meteorological Observatory. — Bulletin, 1900.
Essex Institute. — Annual Reports, 1900.
Franklin Institute. — Journal, Vols. CXLIX., CL.
Geological Survey of Canada. — Report, X.; the Klondike; the Sydney coal field.
Geological and Natural History Survey of Minnesota. — Report, 1895–8.
Mazamas. — Mazama, II.
Minnesota Academy of Natural Sciences. — Bulletin, III. 1.
National Geographic Magazine. — XI.
Torrey Botanical Club. — Bulletin, XXVII.
United States Department of Agriculture. — Bulletin of New England Weather Service, 1900; daily weather map, 1900.
United States Geological Survey. — Monographs, XXXII. 2; XXXIII.–XXXVIII.; Cape Nome; map of Alaska.

FOREIGN.

ALPINE CLUBS.

- Centre Excursionista de Catalunya.* — Butlletí, 58–66.
Club Alpine Belge. — Bulletin, 25.
Club Alpin Français. — Bulletin, 1899, 12; 1900, 1–11; Annuaire, 1899.

- Section des Alpes Maritimes : Bulletin, XIX. Section de la Côte d'Or et du Morvan : Bulletin, 1878, 1879, 1885-1900. Section Lyonnaise : Revue Alpine, VI. Sections de Pau, Basque, etc. : Bulletin Pyrénéen, 16-20. Section du Sud-Ouest : Bulletin, XLVII.
- Club Alpino Italiano*. — Rivista, XVIII, 12 ; XIX. Sezione di Bergamo : Relazioni, 1899 ; Prealpi Bergamasche. Sezione di Milano : Annuario, XII. Sezione di Roma : Bollettino, 1899.
- Club Alpin Suisse*. — Jahrbuch, XXXV. ; Alpina, VIII. Sections Romandes : L'Echo des Alpes, 1900.
- Club Alpino Siciliano*. — Sicula, IV. 1-4 ; V. 1-3.
- Club Touristi Triestini*. — Il Tourista, VI., VII., 1-3.
- Danske Turistforening*. — Aarskrift, 1900.
- Deutscher und Oesterreichischer Alpenverein*. — Mittheilungen, 1899, 24 ; 1900, 1-22 ; Zeitschrift, XXX.
- Kruimskij Gornij Klub*. — Zapiski, 1899, 9-12 ; 1900, 1-10.
- Magyarországi Kárpát-egyesület*. — Jahrbuch, 1899, 1900.
- Norske Turistforening*. — Årbog, 1900.
- Oesterreichischer Alpenclub*. — Alpen-Zeitung, 547-571.
- Oesterreichischer Touristen-Club*. — Touristen-Zeitung, XX.
- Piolet Club*. — Le Piolet, II. 1-6 ; 11-12.
- Scottish Mountaineering Club*. — Journal, Nos. 31-33.
- Siebenbürgischer Karpathenverein*. — Jahrbuch, XX.
- Società Alpina Friulana*. — In Alto, XI.
- Società Alpina Meridionale*. — Bollettino, VII. 4 ; Calendario, 1900.
- Società degli Alpinisti Tridentini*. — Annuario, XXI.
- Società Alpina delle Giulie*. — Alpi Giulie, V.
- Société des Touristes du Dauphiné*. — Annuaire, I. ; XXV.
- Svenska Turistforening*. — Årsskrift, 1900.
- Thüringerwald-Verein*. — Monatsblätter, VII. 10-12 ; VIII. 1-9.

GEOGRAPHICAL SOCIETIES.

- Geographische Gesellschaft* (Greifswald). — Jahresbericht, VII.
- Gesellschaft für Erdkunde* (Berlin). — Verhandlungen, XXVI. 8-10 ; XVII. 1-7.
- Imperatorskoye Russkoye Geographicheskoye Obshchestvo*. — Report, 1898 ; Bulletin, XXXIV. 5-6 ; XXXV. 1-6.
- Instituto Geografico Argentino*. — Boletín, XX. 7-12.
- Kais.-königliche Geographische Gesellschaft* (Vienna). — Mittheilungen, XLII. ; Abhandlungen, I. 1-5.
- Nederlandsch Aardrijkskundig Genootschap*. — Tijdschrift, XVI. 6 ; XVII. 1-6 ; Naamlijst.
- Royal Geographical Society*. — Geographical Journal, XV. ; XVI.
- Royal Geographical Society of Australasia*. — Proceedings, XV.
- Sociedad Geografica de Madrid*. — Boletín, XLI. 4 ; XLII. 1-3 ; Revista, 24-31.
- Sociedade de Geographia de Lisboa*. — Boletim, XVII. 1-4.
- Società Geografica Italiana* (Rome). — Bollettino, Ser. IV., Vol. I. ; Indice generale.

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- Société de Géographie* (Paris). — Bulletin, XX. 4; *La Géographie*, 1900.
Société de Géographie Commerciale (Bordeaux). — Bulletin, XXVI.
Société de Géographie Commerciale de Paris. — Bulletin, XXI. 9-10; XXII. 1-5.
Société de Géographie de Tours. — Revue, I.; II.; XVI. 2.
Société Khédiviale de Géographie (Cairo). — Bulletin, V. 4-7.
Société Neuchâteloise de Géographie. — Bulletin, XII.
Société Royale de Géographie d'Anvers. — Bulletin, XXIII. 3-4; XXIV. 1-3.
Tokyo Geographical Society. — *Journal of Geography*, 128-138.
Verein für Erdkunde (Leipzig). — *Mitteilungen*, 1899.
Verein für Erdkunde an der Universität Wien. — *Berichte*, XXV.

OTHER EXCHANGES.

- Kais.-königliches Naturhistorisches Hofmuseum*. — *Annalen*, XIII. 4; XIV. 1-4; XV. 1.
Annales de Géographie. — IX. 43-48.
Intelligence Division, War Office. — *Geographical Index*, Jan.-Dec., 1899, 1900.
Journal of School Geography. — IV.
Journal de Zermatt. — X.
Nova Scotian Institute of Science. — *Proceedings*, III. 1.
Oberlin College Library. — *Laboratory Bulletin*, 10.
Revue Géographique Internationale. — Nos. 289-297.
Société de Spéléologie. — *Spélunca*, V. 17-20; VI. 21-22; *Memoires*, I. 3; III. 22; IV. 23-24.
Teikoku Daigaku. — *Journal*, XI. 4; XII. 4; XIII. 1-2; *Calendar*, 1899-1900.
Tufts College. — *Studies*, 6.

DONATIONS.

[Names of Members in Italics.]

- Along the Bosphorus. Susan E. Wallace. Gift of *A. S. Lynde*.
 Alps, The. F. Umlauf. Gift of *H. P. Curtis*.
 An Inland Voyage. R. L. Stevenson. Gift of *Miss A. M. Hunt*.
 Anuario Estadístico de la Provincia de Buenos Aires. C. P. Salas.
 Ascent of Mt. St. Elias by H. R. H. Prince Luigi Amadeo di Savoia. Filippo de Filippi. Gift of *the duke of the Abruzzi*.
 Autour de Zermatt.
 Biographical notices of Jean Payot and Johann zum Taugwald. *E. Whymper*. Gift of Author.
 By Broomstick Train.
 Campaigns of the British Army at Washington and New Orleans. Gift of *Miss I. Batchelder*.
 Catalogue of Library. Gift of *Alpine Club*.
 Century of Geology. *J. L. Le Conte*. Gift of Author.
 Chamonix and Mont Blanc. *E. Whymper*. Gift of Author.

- Chosün. *P. Lowell.* Gift of *Winthrop Coffin*.
 Circassia. *G. L. Ditson.*
 Corner of Spain. *M. C. Harris.* Gift of *J. Ritchie, Jr.*
 Cruise under the Crescent. *C. W. Stoddard.* Gift of *A. S. Lynde.*
 Eclipse Party in Africa. *E. J. Loomis.* Gift of *Miss A. M. Hunt.*
 Egypt, the Land of the Temple Builders. *W. S. Perry.* Gift of *J. Ritchie, Jr.*
 Einige Ergebnisse der meteorologischen Beobachtungen am Observatorium Vallot auf dem Mont Blanc. *J. Hann.*
 Elementary Meteorology. *W. M. Davis.*
 Exploration of Battle River. *Tyrrell.* Gift of Author.
 Fisherman's Luck. *H. Van Dyke.* Gift of *E. E. Norton.*
 Fleuves Sous-Marins. *H. Benest.*
 Formation des Dunes de Sable. *V. Cornish.* Gift of Author.
 Francis Berrian. 2 vols. Gift of *Miss I. Batchelder.*
 From the Alps to the Andes. *M. Zurbriggen.* Gift of *T. R. Gale.*
 From Tonkin to India. *Prince Henri d'Orleans.* Gift of *Winthrop Coffin.*
 Geology of the Cascade Mountains. *J. C. Russell.* Gift of Author.
 Glacières or Freezing Caverns. *E. S. Balch.* Gift of Author.
 Golden Alaska. *E. Ingersoll.* Gift of *J. Ritchie, Jr.*
 Golden North. *C. R. Tuttle.*
 Gossiping Guide to Harvard and Cambridge. Gift of *J. Ritchie, Jr.*
 Guide to Chamonix. 5th ed. *E. Whymper.* Gift of Author.
 Guide to New England States. *Rand, McNally & Co.* Gift of *J. Ritchie, Jr.*
 Guide to Niagara Falls.
 Guide to Pacific Coast. *C. A. Higgins.* Gift of *J. Ritchie, Jr.*
 Guide to the City of Washington. *E. Ingersoll.* Gift of *J. Ritchie, Jr.*
 Guide to Valleys of the Biellese Region. *P. Padovani & E. Gallo.*
 Guide to Yellowstone National Park.
 Guide to Zermatt. 4th ed. *E. Whymper.* Gift of Author.
 Handbook to the South of Ireland. *F. Guy.*
 Highways and Byways in North Wales. *A. G. Bradley.* Gift of *E. E. Norton.*
 Hunting and Fishing in Florida. *C. B. Cory.* Gift of *Mrs. A. F. Cutler.*
 Hydrography of Nicaragua. *A. P. Davis.*
 In Gold and Silver. *G. H. Ellwanger.* Gift of *Miss I. Batchelder.*
 In Portia's Gardens. *W. S. Kennedy.* Gift of *G. W. Taylor.*
 In the Australian Bush. *R. Semon.* Gift of *Winthrop Coffin.*
 Incidents of a Collector's Rambles. *S. F. Denton.* Gift of *C. Newhall.*
 Lake, Field, and Forest. *F. A. Bates.* Gift of Author.
 Last Voyage. *Lady Brassey.* Gift of *Cheever Newhall.*
 Letters during a Tour through France, Switzerland, etc. *T. Raffles.*
 Monadnoc and Other Sketches in Verse. *J. E. Nesmith.*
 Nature Study. *C. J. Maynard.* Gift of *W. R. Davis.*
 New Method of Estimating Age of Niagara Falls. *G. F. Wright.*
 Notes on Calostoma. *H. Webster.*
 Notes on some Fleshy Fungi found near Boston. *H. Webster.*
 Ocean to Ocean.

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On some Lathe-made Stone Objects from the Riffelalp. *E. Whymper*. Gift of Author.
 Overland to Cariboo. *M. McNaughton*. Gift of *J. Ritchie, Jr.*
 Papers on the Waterpower in North Carolina. *G. F. Swain*. Gift of *H. P. Kelsey*.
 Physical Geography. *A. Geikie*. Gift of *J. Ritchie, Jr.*
 Rockies of Canada. *W. D. Wilcox*. Gift of Author.
 Scrambles amongst the Alps. *E. Whymper*. Gift of Author.
 Separates. (11 pamphlets.) *E. A. Martel*. Gift of Author.
 Spain and Morocco. *H. T. Fink*. Gift of *E. E. Norton*.
 Sparks from a Geologist's Hammer. *A. Winchell*. Gift of *F. N. Mudge*.
 Spain. *C. Davillier*. Gift of *Cheever Newhall*.
 Stray Leaves from the Book of Nature. *M. S. De Vere*. Gift of *J. Ritchie, Jr.*
 Supplementary Appendix to Travels amongst the Great Andes. *E. Whymper*. Gift of Author.
 Tour in Italy and Sicily. *L. Lemond*. Gift of *J. Ritchie, Jr.*
 Travels in America. *Earl of Carlisle*. Gift of *Miss I. Batchelder*.
 Travels in Portugal, etc. *H. F. Link*. Gift of *J. Ritchie, Jr.*
 Travels in Three Continents. *J. M. Buckley*. Gift of *G. W. Taylor*.
 Twenty Years in the Near East. *A. G. H. Beaman*. Gift of *H. P. Curtis*.
 Two Seasons in Switzerland. *H. Marsh*. Gift of *F. N. Mudge*.
 Variations of Glaciers, IV., V. *H. F. Reid*. Gift of Author.
 Voyage in the Yacht Sunbeam. *Lady Brassey*. Gift of *C. H. Waldo*.
 Wilderness Hunter. *T. Roosevelt*. Gift of *Cheever Newhall*.
 With Feet to Earth. *C. M. Skinner*. Gift of *A. S. Lynde*.
 Woerl's Guide-books. 9 issues. Gift of *J. Ritchie, Jr.*

PURCHASED.

A Run through Russia. *W. W. Newton*.
 Abode of Snow. *A. Wilson*.
 Algerian Memories. *F. B. & W. H. Workman*.
 Century Atlas. *B. E. Smith*, editor.
 Eruption of Vesuvius in 1872. *L. Palmieri*.
 How to know the Ferns. *F. T. Parsons*.
 Journal of a Tour in the United States, Canada, and Mexico. *Lady Howard*.
 Letters of De Brosses.
 London and Londoners. *R. Pritchard*, editor.
 Picturesque Burma. *Mrs. E. Hart*.
 Russian Hosts and English Guests in Central Asia. *J. T. W. Perowne*.
 To Gipsyland. *E. R. Pennell*.
 Tour on the Prairies. *W. Irving*.
 Transatlantic Sketches. *Henry James, Jr.*
 Trip through the Eastern Caucasus. *J. Abercromby*.

Treasurer's Report for 1900.

The receipts and payments for the year were as follows :—

RECEIPTS.

Cash on hand, Jan. 1, 1900, unappropriated	\$789.21
“ for Room Fund and prepayments	150.00
“ “ Eliot Memorial Fund	86.00
	<hr/>
	\$1025.21
Mrs. Delia D. Thorndike's bequest	1000.00
Life-Memberships, 26 at \$30	780.00
Interest on Permanent Fund for 1899 and 1900, voted to Reserve Fund	331.63
Interest on Reserve Fund for 1899 and 1900, voted to Reserve Fund	78.92
Received from Committee on Field Meetings and Excursions and voted to Reserve Fund	75.00
Received for Mount Washington Refuge Fund	147.00
Annual assessments : 3 members for 1899	
“ “ 832 “ “ 1900	
“ “ 2 “ “ 1901	
	<hr/>
837 members at \$3.00	2511.00
Admission fees : 145 new members at \$5.00	725.00
Interest on Treasurer's deposit for 1900	44.69
APPALACHIA and other publications :	
Sales of APPALACHIA and maps \$	95.51
“ “ Walks and Rides	230.62
	<hr/>
	326.13
Donations :	
For Library	\$14.93
“ Rooms and Keys	306.50
“ Use of Rooms	44.00
	<hr/>
	365.43
Department of Art : Sella Collection	1.00
Department of Topography : Sale of maps	18.66
Department of Exploration : Alpine Section	4.40
Annual Reception	33.30
Total unappropriated receipts	<hr/>
	\$4029.61
	<hr/>
	\$7467.37
	<hr/>

PAYMENTS.

Trustees of the Permanent Fund :

Mrs. Delia D. Thorndike's bequest	\$1000.00
Life-Memberships : 26 at \$30.00	780.00

Trustees of the Reserve Fund :

Interest on Permanent and Reserve Funds	\$410.55
Cash from Field Meetings and Excursions	75.00

Stationery, Printing, and Postage :

General expenses	\$495.70
Club Register for 1900	137.00
	<hr/>
	\$632.70

Clerical services	321.25
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Library :

For Books and sundries	\$87.86
" Binding	82.68
	<hr/>
	170.54

Expense of Meetings	223.40
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Rooms :

Rent, 1049-51 Tremont Bldg., 12 months, \$1025.04	
Cleaning	102.00
Electric light	35.55
Fittings and supplies	51.81
Storage warehouse	23.10
	<hr/>
	1237.50

APPALACHIA and other publications :

Reprints, Vol. IX., No. 1	\$16.16
" Vol. IX., No. 2	723.76
Delivery	68.00
Business agent	50.00
Walks and Rides	97.16
E. M. Bacon, — royalty	25.96
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	981.04

Department of Art	84.75
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Department of Topography	16.00
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Department of Improvements	275.00
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Real estate	37.47
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Total expenses	<hr/>	3979.65
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Cash on hand, Dec. 31, 1900 :

Money unappropriated	\$873.17	
Prepayments of subscriptions and obligations	116.00	
Mt. Washington Refuge Fund	147.00	
Eliot Memorial Fund	86.00	
		1222.17
		\$7467.37

Respectfully submitted,

RUFUS A. BULLOCK,

Treasurer.

TREASURER'S REPORT.

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RECEIPTS FOR FIRST TWENTY-FIVE YEARS.

YEAR.	MEMBERSHIPS.					Life Membership.	Sales of APPALACHIA and other Publications.	Interest.	Annual Reception.	Field Meetings and Excursions.	Donations.	Total.
	Admission Fees.	Yearly Assessments.	Back Assessments.	Advance Assessments.	Total.							
1876	252.00	....	....	....	252.00	....	43.13	....	....	....	....	295.13
1877	50.00	254.00	8.00	....	312.00	....	98.00	....	....	....	....	410.00
1878	54.00	264.00	....	....	318.00	60.00	75.70	....	....	....	43.00	496.70
1879	148.00	256.00	40.00	4.00	448.00	....	130.85	1.90	....	....	221.70	802.45
1880	178.00	332.00	24.00	4.00	538.00	90.00	116.90	10.79	....	....	86.21	841.90
1881	222.00	384.00	18.00	12.00	636.00	120.00	141.40	17.59	....	....	62.55	977.54
1882	256.00	528.00	74.00	....	858.00	90.00	309.43	22.07	....	....	2.00	1281.50
1883	385.00	1000.00	20.00	27.00	1442.00	210.00	197.58	39.72	9.72	82.88	22.00	2003.90
1884	285.00	1059.00	21.00	9.00	1374.00	60.00	93.51	53.29	26.80	11.47	1.00	1620.07
1885	375.00	1212.00	69.00	12.00	1668.00	60.00	113.19	61.09	45	70.73	534.50	2507.96
1886	426.00	1317.00	90.00	24.00	1857.00	330.00	247.94	88.62	12.50	124.35	364.20	3024.61
1887	385.00	1491.00	90.00	42.00	2008.00	180.00	183.80	79.34	10.00	40.20	114.00	2615.34
1888	355.00	1536.00	117.00	12.00	2020.00	180.00	67.06	42.52	9.20	45.94	754.76	3119.48
1889	655.00	1617.00	69.00	27.00	2368.00	120.00	93.85	151.29	11.48	....	127.60	2872.22
1890	450.00	1620.00	24.00	15.00	2109.00	150.00	1168.13	217.12	3.73	....	220.85	3868.83
1891	500.00	1743.00	12.00	9.00	2264.00	120.00	354.28	182.54	....	146.27	20.00	3087.09
1892	560.00	1830.00	15.00	9.00	2414.00	300.00	625.22	130.29	....	70.58	.50	3540.59
1893	480.00	1908.00	6.00	....	2394.00	300.00	20.97	431.90	....	13.57	454.50	3614.94
1894	640.00	1968.00	9.00	12.00	2629.00	210.00	407.30	17.65	....	14.04	22.25	3300.24
1895	385.00	2016.00	6.00	12.00	2419.00	90.00	66.69	241.70	20.55	....	10.00	2847.94
1896	510.00	2076.00	6.00	42.00	2634.00	180.00	83.37	225.45	4.97	50.00	276.00	3453.79
1897	650.00	2094.00	18.00	15.00	2777.00	150.00	1197.87	251.48	....	155.00	461.18	4982.53
1898	670.00	2235.00	9.00	27.00	2941.00	420.00	668.70	198.80	35.09	80.00	508.75	4852.34
1899	680.00	2346.00	15.00	....	3041.00	690.00	251.88	220.76	47.10	150.00	377.38	4778.12
1900	725.00	2496.00	9.00	6.00	3236.00	780.00	345.79	455.24	33.30	75.00	1516.83	6442.16
Total	10286.00	33582.00	769.00	320.00	44957.00	4890.00	7102.54	3141.15	224.89	1130.03	6191.76	67637.37

EXPENDITURES FOR FIRST TWENTY-FIVE YEARS.

YEAR.	Permanent Fund.	Reserve Fund.	Stationery, Postage, and Printing.	APPALACHIA and other Publications.	Department of Topography.	Improvements and Explorations.	Natural History and Art.	Clerical Expenses.	Expenses of Meetings.	Library.	Club Room.	Donations.	Total.
1876	....	....	109.91	140.86	....	15.00	....	....	....	....	....	....	265.77
1877	....	....	60.65	364.13	....	....	13.45	....	....	....	....	....	438.23
1878	....	....	202.31	169.80	2.00	20.00	52.48	....	....	....	....	....	446.59
1879	60.00	....	162.31	347.92	19.20	158.76	....	....	....	....	....	....	748.19
1880	90.00	....	186.17	318.13	19.00	72.60	....	....	....	....	....	....	685.90
1881	120.00	....	394.09	246.23	37.95	68.00	....	19.75	22.70	....	....	....	908.72
1882	90.00	....	258.99	675.93	25.40	....	....	34.50	25.00	....	....	....	1109.82
1883	281.72	....	389.73	366.27	23.65	160.37	....	67.41	1.38	69.78	....	....	1360.31
1884	113.42	....	382.49	1176.53	....	21.00	....	57.62	....	58.10	....	....	1809.16
1885	86.48	....	363.27	361.31	229.00	102.00	....	106.00	53.06	72.50	284.17	25.00	1682.79
1886	270.00	....	432.38	932.91	77.73	46.00	74.00	121.45	171.15	131.72	667.30	49.88	2974.52
1887	388.38	1000.00	289.38	566.71	538.97	123.02	20.12	107.12	145.45	102.50	504.81	....	3786.46
1888	280.00	100.00	473.95	597.59	....	779.55	8.32	49.50	93.45	120.56	456.12	....	2950.04
1889	220.00	114.70	390.77	1127.91	7.20	118.58	86.76	123.75	68.86	67.33	487.34	....	2813.20
1890	283.48	48.59	463.43	1682.95	....	46.07	101.56	181.00	58.35	96.06	464.95	....	3426.44
1891	305.64	605.71	389.27	835.17	50.00	123.00	45.36	191.50	121.60	117.10	471.69	105.30	3359.34
1892	399.56	200.00	438.72	1059.89	216.33	46.00	122.39	197.50	133.95	113.45	534.08	61.34	3523.81
1893	415.27	74.97	446.07	1086.18	....	684.15	664.45	221.95	203.70	59.10	576.04	25.00	4456.88
1894	210.00	....	398.49	947.59	....	228.75	74.48	236.80	194.14	89.66	540.28	25.00	2945.19
1895	90.00	79.22	402.75	571.57	164.43	205.35	109.78	249.75	157.05	128.56	493.90	25.00	2677.36
1896	180.00	900.00	394.03	2418.28	40.99	337.08	47.62	248.00	180.05	139.99	855.48	25.00	4866.52
1897	150.00	900.00	506.15	2473.97	....	387.82	79.11	258.50	171.13	142.10	1243.66	25.00	5237.44
1898	420.00	....	475.61	979.89	30.56	227.95	74.39	249.50	181.85	161.96	1280.93	....	4082.64
1899	690.00	75.00	570.47	1007.54	....	441.97	15.09	241.00	166.83	136.94	1160.84	....	4505.68
1900	1780.00	485.55	632.70	981.04	16.00	312.47	84.75	321.25	223.40	170.54	1237.50	....	6245.20
Total	6923.00	1683.74	9214.09	21434.30	1498.41	4726.09	1674.11	3283.85	2373.10	1977.95	11259.09	366.52	66415.20

* Decrease.

Report of the Trustees of the Permanent and Reserve Funds for the Year 1900.

PERMANENT FUND. — PRINCIPAL.

1900.

Jan. 1.	Amount of Permanent Fund on hand, last account	\$5143.95
"	Amounts received from R. A. Bullock, Treas., for Life-Memberships during year : —	
Jan. 29.	Edward C. Pickering	\$30.00
"	J. Raynor Edmands	30.00
"	George William Yeaton	30.00
"	James H. Whitman	30.00
"	Mrs. Mary A. Basto	30.00
Mar. 8.	F. W. Dallinger	30.00
"	Miss Eliza C. Fisher	30.00
"	" F. H. Murray	30.00
May 25.	John Herbert	30.00
"	Miss M. A. Knowles	30.00
"	Mrs. James H. Blizzard	30.00
July 27.	Alexander Hamilton Rice	30.00
"	George S. Wright	30.00
"	Dr. G. N. P. Mead	30.00
"	Mrs. G. N. P. Mead	30.00
Oct. 19.	Miss Caroline H. Fabens	30.00
"	" Alice M. Patterson	30.00
"	" Charlotte M. Endicott	30.00
"	" Helen E. Endicott	30.00
"	" Florence E. Chester	30.00
"	" Mabel C. Chester	30.00
"	Mrs. James F. Curtis	30.00
"	Dr. G. P. Davis	30.00
"	Samuel Usher	30.00
"	George W. Brinker	30.00
Dec. 21.	Henry A. Withington	30.00
		780.00
Dec. 28.	Delia D. Thorndike bequest	1000.00

PERMANENT FUND. — INTEREST.

1900.

Jan. 1.	Amount of interest on hand, last account	\$149.19
Dec. 28.	Suffolk Savings Bank : 12 months, to Oct. 1, 1900	33.33
"	Provident Institution for Savings : 12 months, to July 18, 1900	44.49
"	Lexington Savings Bank : 12 months, to Oct. 1, 1900	35.17

RESERVE FUND.

359

Dec. 28. Eliot Five Cents Savings Bank : 12 months, to Oct. 10, 1900	\$25.23
" Franklin Savings Bank : 12 months, to Aug. 1, 1900	12.50
" Boston Five Cents Savings Bank : 12 months, to Oct. 1, 1900	12.49
" Canton Institution for Savings : 12 months, to Oct. 1, 1900	19.23
Total accrued interest during two years . .	331.43
" Paid R. A. Bullock, Treas., as per vote of Council, accrued interest for 1899 and 1900	331.63
" Total Principal on hand, January 1, 1901	\$6923.95
Deposited in —	
" Suffolk National Bank, Book 100,753	1050.83
" Provident Institution for Savings, Book 118,265	1403.05
" Lexington Savings Bank, Book 1921	1032.00
" Eliot Five Cents Savings Bank, Book 32,233 .	846.41
" Franklin Savings Bank, Book 70,143	666.50
" Boston Five Cents Savings Bank, Book 425,754	486.87
" Canton Institution for Savings, Book 9015 .	438.29
" Delia D. Thorndike, bequest, cash on hand .	1000.00
	<u>6923.95</u>

RESERVE FUND. — PRINCIPAL.

1900.

Jan. 1. Amount Reserve Fund on hand, last report	\$1198.19
" " Interest on hand, last account	\$37.98
Jan. 21. From Excursion Committee, to be used by Committee, when so voted by Council	75.00

RESERVE FUND. — INTEREST.

Dec. 25. Boston Five Cents Savings Bank: 12 months, to Oct. 1, 1900	31.52
" Massachusetts Loan and Trust Co.: 12 months, to Jan. 1, 1901	9.42
Total interest accrued during two years . .	78.92
Jan. 27. Paid R. A. Bullock, Treas., accrued interest for the years 1899 and 1900, per vote of Council	78.92
Jan. 29. Received from R. A. Bullock, Treas., to be added to the principal, accrued interest for two years on Permanent and Reserve Fund	410.55
Total Principal on hand January 1, 1901	<u>\$1683.74</u>

Deposited in —	
Boston Five Cents Savings Bank, Book 229,173	\$1369.55
Massachusetts Loan and Trust Co.'s note . . .	314.19
	<hr/> \$1683.74
	<hr/>
Total Permanent Fund	\$6923.95
Total Reserve Fund	1683.74
Total in hands of Trustees	<hr/> \$8607.69
	<hr/>

ISAAC Y. CHUBBUCK,	} Trustees of the	
CHARLES H. FRENCH,		} Permanent and
REST F. CURTIS,			} Reserve Funds.

The Committee appointed to examine the accounts of the Appalachian Mountain Club respectfully report:—

We have examined the accounts of the Treasurer for the year 1900, and believe them to be correct. Proper vouchers were shown for all payments, and the cash on hand was verified, amounting to twelve hundred and twenty-two dollars and seventeen cents (\$1222.17).

We have examined the accounts of the Trustees of the Permanent and Reserve funds, and find them to be correct.

The Permanent Fund amounts to sixty-nine hundred and twenty-three dollars and ninety-five cents (\$6923.95).

The Reserve Fund amounts to sixteen hundred and eighty-three dollars and seventy-four cents (\$1683.74).

The investments, as reported by the Trustees, have been verified.

LOUIS F. CUTTER,	} Auditing	
JOHN E. ALDEN,		} Committee.
FRED V. FULLER,		

BOSTON, January 8, 1901.

Financial Report on Three Mile Island and Camp.

RECEIPTS.

12 Subscriptions of \$50.00:

A. Agassiz, C. Bigelow, J. H. Bowditch, W. Coffin, T. K. Gale, S. C. Lawrence, A. S. Lynde, J. Muir, C. Newhall, J. L. Nichols, A. A. Perry, G. W. Taylor	\$600.00
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20 Subscriptions of \$25.00:

G. W. Armstrong, I. Batchelder, W. R. Chester and family, H. Collamore, A. F. Cutler, W. R. Davis, W. P. Fiske, C. H. French, T. O. Fuller, J. M. Gleason, E. Harrington, S. M. Hawes, P. R. Hollingsworth, C. F. Peirce, J. Ritchie, Jr., J. Robson, L. E. K. Robson, C. E. Rogerson, G. M. Weed, A. Zeigler	500.00
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10 Subscriptions of \$20.00:

H. S. Bean, C. G. Bullard, L. F. Cutter, G. P. Davis, A. C. Fearing, Jr., H. C. Francis, J. E. Holmes, C. N. Mason, W. H. Niles, H. C. Parker	200.00
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1 Subscription: W. L. Chaloner	26.75
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3 Subscriptions of \$15.00:	
G. E. Howe, C. E. Lord, J. S. Thorndike	\$45.00
43 Subscriptions of \$10.00:	
J. E. Alden, N. P. Allen, J. F. Beede, O. L. Briggs, L. H. Brittain, Mrs. F. H. Brown, W. H. Cades, I. Y. Chubbuck, A. G. Cochrane, O. B. Cole, U. H. Crocker, C. A. Cutter, A. P. Dana, E. C. Eastman, F. Endicott, F. Farr, P. B. Field, A. H. French, A. T. Haskell, A. F. Haynes, J. Herbert, W. G. Hills, H. C. Holt, E. W. Howe, A. Jones, M. A. Knowles, C. Larned, A. W. Lincoln, S. H. Little, W. T. May, P. S. Moxom, G. D. Newcomb, J. Porter, A. H. Reed, F. A. Schirmer, A. E. Scott, H. N. Shepard (for land), W. C. Wait, J. H. Whitman, F. C. Wight, F. B. Wildes, A. B. Woodworth, F. O. Worthley	430.00
2 Subscriptions of \$6.00:	
H. P. Curtis, E. M. Plummer	12.00
57 Subscriptions of \$5.00:	
E. H. Abbot, K. H. Andrews, H. H. Barrett, C. J. Bates, B. D. B. Bourne, L. E. Brown, Mrs. N. H. Brown, A. M. Butler, F. O. Carpenter, M. A. Coe, C. W. Cousens, C. F. Dowse, I. Elting, C. M. Endicott, C. E. Fay, A. F. Flint, F. V. Fuller, M. A. Furbish, J. F. Goode, Mrs. J. F. Goode, W. H. Goodwin, L. E. Griswold, R. A. Hale, A. Harvey, L. L. Holden, E. L. Homer, H. Jackson, A. S. Johnson, G. M. Jones, A. E. Lanning, S. E. Lee, G. T. Little, S. C. Lord, C. F. Mason, G. N. P. Mead, E. F. Munroe, G. E. Munroe, E. E. Norton, J. B. Osborn, C. P. Porter, M. G. Potter, W. G. Preston, E. M. Rice, C. A. L. Richards, C. F. Rogers, A. P. Rugg, W. S. Rumrill, S. Saunderson, E. F. Sawyer, W. A. Seward, J. P. Stow, M. A. Vinal, C. H. Waldo, H. W. Warren, M. Waterman, J. H. Welch, H. A. Withington	285.00
1 Subscription of \$4.00: Mrs. F. Endicott	4.00
9 Subscriptions of \$3.00:	
E. F. Blacker, C. F. Dodge, G. W. Foster, T. W. Higginson, J. G. Hosmer, S. F. S. Morton, S. R. Taber, E. S. White, A. D. Wilde	27.00
5 Subscriptions of \$2.50:	
Mr. and Mrs. Allen Chamberlain, J. A. Muirhead, Misses G. and K. Tompson	12.50
14 Subscriptions of \$2.00:	
L. S. Bourne, M. F. Cummings, P. F. Goodwin, C. S. Greene, K. D. Griswold, M. C. Hewett, Mrs. C. L. James, L. A. Metcalf, C. M. Seaver, S. A. Stone, O. F. Timlin, D. L. Viles, O. A. Welch, C. M. Williams	28.00
17 Subscriptions of \$1.00:	
F. H. Burt, J. C. Clarke, Q. E. Dickerman, E. A. Ellis, H. E. Endicott, E. C. Flanigan, E. D. Hinckley, R. R. Joslin, J. E. Kimball, G. M. Marsters, E. F. Merriam, F. E. Myrick, H. E. Richards, L. B. Sperry, H. F. Sylvester, L. E. Taft, F. Zirngiebel	17.00
Contribution from the Montalban Club, balance in treasury .	137.80

362 REPORT OF TRUSTEES OF REAL ESTATE.

Net proceeds from Course of Lectures	\$205.00
Subscription of John Robson for furnishing	10.00
	<u>\$2540.05</u>

PAYMENTS.

Mary W. Eastman, purchase of remainder of island	\$850.00
James P. Leighton, contract for building camp	1323.00
“ “ “ extras ordered by Committee	22.70
Burditt & Williams, hardware for camp	12.24
New Hampshire Fire Insurance Co., policy, \$1200, for 3 years	24.00
Contribution toward cost of cook-house	10.00
Expenses of architect June 21 and Nov. 3	7.00
Labor on island in Sept., Nov., Dec., and Jan.	23.25
George W. Bartlett, labor of eight men Nov. 30 and Dec. 1	12.00
“ “ “ stove funnel	2.64
“ “ “ use of launch, Nov. 30 and Dec. 1	10.00
R. B. Henderson, use of launch, Nov. 17	5.00
	<u>\$2301.83</u>
Balance on hand Feb. 15, 1901 (for furnishings, etc.)	<u>\$238.22</u>

Report of the Trustees of Real Estate for 1900.

THE Trustees of Real Estate respectfully report, that the Shelburne Reservation continues to gain in beauty, now that the ground has been cleared from rubbish and inclosed by neat fences, and that nearly all the trees which were planted have lived and grown. Two neat and appropriate signs mark the reservation. Twice during the summer a fire, undoubtedly caused by sparks from locomotives upon the Grand Trunk Railroad, spread from its location upon our land, and was extinguished with considerable difficulty. We trust that our correspondence with the corporation will lead to greater care upon its part in the future.

The paths through and from the Randolph Reservation have been extended and improved, and their use to gain the mountain summits increases every year. During the autumn its boundaries have been marked. The revised map of the northern slopes of Mts. Madison, Adams, and Jefferson, issued last summer by Mr. Louis F. Cutter, formerly the Councillor of Topography, is in such demand by visitors to the locality that it is difficult sometimes to get a copy.

Upon the Joseph Story Fay Reservation, the land within the village, south from the sawmill, was cleared from rubbish

and inclosed by a neat fence last year, and the forest tract surveyed and in part fenced. The fencing has been finished. The trees which were blown down during the severe storm of November, 1898, will be got out and sold this winter. The lot upon the stage road to the Profile House, which had been sold by Miss Fay to the town of Lincoln for a schoolhouse and was afterwards used as a tenement house, has not been obtained as yet, but negotiations are in progress by which we hope it will be secured for the Club and taken within the limits of the reservation.

By way of announcing the existence of this reservation, and the fact that it is a memorial to Mr. Fay, there will be carved in the spring upon a big boulder on the western side of the highway north of the sawmill the following inscription:—

FAY RESERVATION

Given to the

Appalachian Mountain Club

In Memory of

JOSEPH STORY FAY

1812-1897.

Cloth notices have been posted that the reservation "is open freely to the use and enjoyment of all persons," and that it is expected no one will hurt the trees, nor set fires, nor leave papers or other rubbish.

The turbulence of the river during the spring and autumn freshets, and the quantity of water which it then pours down, threaten to make the channel between the land within the village and the island the main channel, and so put our island to the east of the river, and also to cut a passage through the land itself. Both these dangers we hope to meet by the strengthening of our banks with rocks, the building of a dam, and especially the planting of willows and trees.

The holdings of the Club have been increased during the year by a second gift from Mary W. Eastman, wife of Edson C. Eastman of Concord, New Hampshire, of a tract adjoining the Club's two and a third acres upon Three Mile Island in Lake

Winnetoesaukee, so that its entire holding now amounts to between five and six acres. Mr. R. B. Lawrence has bought from Mrs. Eastman, upon his own account, a tract of ten acres, and Mrs. Eastman has given an agreement to convey to the Club the remainder of the island at a fixed price. Subscriptions have been made of enough money to make this purchase and to erect upon the island a permanent camp; and for the present the camp and island have been put into the hands of a committee, consisting of Mr. Lawrence, Mr. J. F. Beede, and Mr. Shepard.

The path up Mount Grace has been marked with signs; and cloth notices like those of the Fay Reservation have been posted.

For the Trustees.

HARVEY N. SHEPARD, *Chairman.*

Reports of the Councillors for the Autumn of 1901.

Topography.

BY FREDERIC ENDICOTT.

THE work of the Department of Topography has been this year in the direction of publication. Two hundred and fifteen blue print copies of Mr. Louis F. Cutter's revised map of the northern slopes of Mts. Madison, Adams, and Jefferson, have been issued at a cost of \$20.34. From sales of these the sum of \$38.75 has been received, making the net profit on account of the map \$18.41. The thanks of the Club are due to Mr. Cutter for his excellent work, and to Mr. Watson and Mr. Chase at the Ravine House, and Miss Clark at the Summit House, for their interest in bringing the map to the notice of lovers of the mountains. It is to be hoped that this map can be gradually extended to cover the whole Presidential Range, as the United States Geological Survey's maps, from financial limitations, give only a rough approximation to the real contours.

A photo-lithographic copy of Mr. E. G. Chamberlain's panoramic view from Prospect Hill, Waltham, has been printed and will appear in the next number of APPALACHIA. This view gives the names and distinctive features of over three hundred prominent objects to be seen in a clear day from the summit of

the hill. Three hundred additional copies to be sold separately were also ordered, but owing to an enlargement of the edition of APPALACHIA they will all be used in the next number. If possible, more copies will be printed.

Some attention has been given during the year to the subject of a map giving the location of the principal summits of New England, which is much needed. This should also include the Adirondack and Catskill regions, and the Canadian summits, visible from Mt. Washington, and perhaps from Mt. Mansfield. So far as Massachusetts, Rhode Island and Connecticut are concerned, the material from which it could be made is to be found in the Government maps and other publications. The same is true of the Adirondack region, the western part of Vermont, and the southwestern part of Maine. The White Mountain region is well shown by the Club's map of the White Mountains, and also by four of the United States sheets; but the rest of New Hampshire, with the exception of the neighborhood of Monadnock, has no accurate map. New Hampshire, which reaps a greater financial harvest from its topographical features than any other New England State, finds it impossible to coöperate with the United States in the survey.

Reports of the Councillors for the Autumn of 1900.

Art.

BY MABEL C. CHESTER.

THE most important gift of the year to the Department of Art has been a collection of photographs which were formerly the property of Mrs. J. H. Thorndike, and which have been given to the Club by her heirs. It consists of more than 800 pictures, 600 of which are stereoscopic views. Among them are many superb scenes in the Pyrenees and in out-of-the-way corners of France and Switzerland. Germany is well represented, and there are a few Russian and Japanese prints, while the stereoscopic views deal with our own continent from Alaska to Mexico.

We are indebted to Mrs. Julia E. Hoffman for a beautiful

picture of Mt. Hood, which has been framed, and hangs on the wall of the reception room, where it has been much admired by all who have seen it.

Mr. Walter D. Wilcox has given us further evidence of his artistic work through the portfolio which he has presented containing five charming views taken in the Canadian Rockies.

From Mr. Henry G. Peabody we have received a book containing an interesting set of pictures taken in the Grand Canyon, Arizona.

We have purchased from Mr. George R. King a series of his fine North Carolina photographs, which, when supplemented by the set which he has offered to give to the Club, will fill a special album.

The accumulation of separate mounted photographs through the efforts of previous Councillors has been so great that it was necessary to devise a system for storing them safely and conveniently. Accordingly, with the assistance of Mr. Ritchie, to whom the Councillor has been much indebted throughout the year, cases and sets of drawers have been purchased, and now all the stereoscopic views, and all the smaller mounted prints, have dust-proof boxes which serve also to classify them roughly.

During the last twelve months all the volumes which required it have been distinctly lettered on the back, and the views contained in them made more easily accessible. The new album just completed contains Mrs. Thorndike's French prints, some 65 in number.

Frequent calls for special photographs have emphasized the necessity of having some definite system of arrangement, and, with the advice and assistance of Mrs. Lewis B. Tarlton, a simple library classification has been adopted, which is capable of extension with the growth of the collection. Special thanks are due to Mrs. Tarlton for further aid in the writing of suitable catalogue cards.

There have been several exhibitions within the year. The first, at the annual reception, was largely of water-colors, one series of which by Miss S. M. Barstow and another by Mr. Walter L. Chaloner covered the wall space in the exhibition hall. Mr. L. L. Willcutt loaned for the occasion 50 beautifully tinted Japanese photographs, including the cherry blossoms,

cryptomeria avenue, and many other scenes, familiar and unfamiliar to us ; and there were also four large Japanese pictures lent by Mrs. W. E. Bowditch. Mr. Alexis H. French sent two of his fine White Mountain views, enlarged from smaller photographs, and Mr. Frederic Endicott exhibited the choice collection which resulted from his trip to Ripton, Vermont, the previous autumn. These were supplemented by the interesting albums of Miss Katharine H. Andrews, Mr. E. W. Howe, Mr. French, Mr. F. V. Fuller, Mr. Charles Pollock, and Dr. James S. Thorndike.

At the President's "at home" at the Club rooms in May, Mr. King exhibited a beautiful series of views of the park systems throughout the country, and of North Carolina, beside some foreign subjects, part of which were artistically colored by Mrs. Rufus P. Williams.

The reunions of the Minnewaska trip and the Jackson snowshoe trip each brought together an admirable collection of pictures of those outings, which remained on view for some days in the rooms.

During the latter half of the year there have been frequent changes in the prints exhibited in the reception room, among them being Mr. Wilcox's Canadian views, a small portion of the Sella collection, which has returned from its library tour, and Mr. Reid's Matterhorn pictures, which were hung for the reception given to Mr. Whymper in October.

REPORT OF THE COMMITTEE ON THE SELLA COLLECTION.

EARLY in October, notice was received from the Library Art Club, under whose auspices the Sella Collection has been moving through the towns and cities of New England since November, 1898, that the various sets had now nearly completed their round, and would shortly be surrendered into the hands of the Committee. Almost simultaneously came a request from the authorities of the Boston Public Library that the pictures might be displayed in their art department at least during the period covered by the lectures on mountain climbing, to be given as a Lowell Institute course by our honorary member, Mr. Edward Whymper, of London. This request was gladly granted, and again

the Boston public had an opportunity of enjoying a view of a large selection of representative pictures.

From the Public Library they were delivered over to the Committee. An inspection reveals the fact that the Collection is in a very satisfactory condition, indeed astonishingly so when one considers that for now nearly seven years it has been almost continuously upon exhibition, and for the last two, passing at brief intervals of three weeks from one place to another, subject to all the consequent wear and tear. No better compliment could be paid to the painstaking, scrupulous care with which they have been handled by those to whom they have been intrusted. As a matter of course, the mounts have suffered seriously; but these have in a multitude of instances been carefully repaired. Occasionally more serious injury has been suffered, particularly in the case of the less manageable enlargements. In general, however, the photographs themselves may be declared to be in almost as good a condition as when they were taken from the walls of the Art Club gallery in 1893. Deterioration by fading affects but a small percentage of the pictures of the collection. The loss during the seven years appears to be only nineteen; none of these have vanished during the control of the Library Art Club.

The question of a policy for the future at once confronted the Committee. Should it be held that the educative mission to which the Club had devoted its unique possession was now accomplished, and that the natural wish to have these views available for inspection at all times at our Club rooms should at last be fulfilled? Or should it still be offered as freely as hitherto to all responsible societies that might ask for it? After due consideration, the Committee was unanimous in its decision to recommend to the Club a compromise course: that a set of from one hundred and fifty to two hundred photographs—those most representative of the physiography of the Alps and the Caucasus, at the same time showing the manner of life in these regions, and not omitting particularly striking specimens of photographic art—should be selected, and henceforth be known as “The Loan Collection of Sella Views;” while the balance, some three hundred, should be reserved at the Club room under such conditions as shall be determined by the Committee for 1901.

The Committee furthermore voted to recommend to the Committee for the ensuing year to ask of the incoming council an appropriation sufficient to put the entire collection in as perfect condition as possible; or, if this is not immediately feasible, enough to do this for the proposed “Loan Collection.” This involves the remounting of a large number of the views; indeed, in order not to interfere with the

harmonious effect by a variety of colors, all the pictures of this special set should be similarly treated. It will apparently be possible, as the original mounts are upon a comparatively thin cardboard, to trim away this card to the size of the photograph, and mount the view thus trimmed upon another card of the original size. It is believed that, by a careful reburnishing, numerous slight abrasions can be almost entirely removed.

Miss W. B. Smith, of Cambridge, the Secretary of the Library Art Club, communicates the following interesting items:—

"During 1900, groups 1, 2, and 3 of the Sella Collection have been exhibited thirty-three times between January 1 and November 13. Group 4, which we have had since May 15, has been exhibited nine times, principally through the southeastern part of Massachusetts. The length of time for each exhibit is three weeks. The printed extracts . . . will illustrate in some measure how much the pictures have been appreciated."

"Group 4," here mentioned, was made up from pictures originally discarded in the selection of the original three groups, of about one hundred pictures each, chosen as most available for the exhibits of the Library Art Club. Nevertheless—and such is the nature of these exquisite pictures that it could scarcely be otherwise—these rejected specimens make of themselves a set not inferior in interest to any of the others. Indeed, they were sent to Cedar Rapids, Iowa, in February to be exhibited under the auspices of the School Board, where, we are informed, "they attracted an unusual amount of attention." The writer adds, "we hope that another year we may be so fortunate as to have another series."

No pains have been spared by the Library Art Club to furnish with the several sets various helps in the way of labels, maps, notes, and newspaper clippings, all of which, with the carefully and ingeniously constructed packing-boxes provided with bolts and padlocks, have been turned over to the Committee.

CHARLES E. FAY,	}	<i>Committee on the Sella Collection.</i>
MABEL C. CHESTER,		
HELEN E. ENDICOTT,		
WILLIAM H. LAWRENCE,		
WILLIAM O. WITHERELL,		

Reports of the Councillors for the Autumn of 1900.

Exploration.

BY CHARLES L. NOYES.

THIS year, as last, the only reports of work done that have reached the Councillor refer to the domain of the Canadian Alps. Several members of the Club passed considerable time in this region, and although the bad weather largely interfered with climbing and exploration, so that no new peaks of the first order were ascended, several secondary summits were scaled for the first time, and certain first-class peaks reascended.

For the first time Americans have reached the summit of Mt. Sir Donald, as here reported by Mr. George Vaux, Jr. Mt. Stephen was several times ascended, and for the first time by a lady. It is reported that the north peak of Mt. Victoria was climbed, and a second ascent of Mt. Lefroy made, this time by the couloir, and that no difficulty was encountered by the party. No details of these ascents have reached the Councillor.

Accounts of a number of interesting climbs by Professor A. Michael, and of an exploration of a new pass over the main range of the Rockies by Mr. Charles S. Thompson are hereto appended, as also a discussion, by Mr. J. H. Scattergood, of the topography and a seemingly desirable nomenclature of the high mountains in the region he has reconnoitred between the Ottetail Creek and Beaverfoot River.

RECENT CLIMBS IN THE SELKIRKS AND CANADIAN ROCKIES. BY ARTHUR MICHAEL.

FIRST Attack on Cathedral Peak. — Left the Canadian Pacific Railway at the third siding above Field, and skirted around the mountain to the extreme southwest, where we found a long and difficult couloir, which brought us up to the glacier on the west face. We made for what seemed the highest of the several rock-peaks, and finally — at 4.30 P. M. — reached a gully between these peaks which were inaccessible from this point, which was about one hundred and fifty feet from the summit. The lateness of the hour prevented us from exploring further. A good rock climb. We were in rain or snow the whole day. With Mr. J. H. Scattergood, and C. Häslar as guide.

First Ascent of Emerald Peak, Canadian Rockies. — Climbed to a little alp above Lake Emerald and to the left of moraine, which was followed to the glacier. Up glacier and snowfield and finally turned to the right, ascending steep snow-slopes to the long snow-ridge which led to a small stone-cap, the highest point. About 10,200 feet. One of the finest views I have seen in this part of the country. No difficulty for mountaineers. The peak overlooks the valley of the north fork of the Wapta. With C. Häslar as guide.

First Ascent of Mt. Swanzy. — September 6. Skirted Mt. Abbott, on side towards Mt. Bonney, crossed Lily glacier, and ascended on east side of Swanzy, keeping the rocks; near the summit it was necessary to turn to the extreme left to find a place where the rock-cap could be ascended. Moderately hard rock climbing in places. Magnificent view. Returned through gap between Rampart and Dome, and down Asulkan glacier. With Mr. S. Spenser, and E. Feuz and F. Michel as guides.

First Ascent of Mt. Grizzly in the Hermit Range. — Turned in from the summit of Rogers Pass, and camped overnight between the glaciers coming from Swiss Peaks and from Mt. Grizzly. Rained hard during the night, and next morning (September 3) the only mountain visible was part of Mt. Grizzly. Crossed the glacier to the right, and ascended to the ridge at a point where the rocks are lowest above glacier. Followed ridge, most of the time on rocks, to summit. No special difficulty. About 10,000 feet. View must be grand in fine weather. With E. Feuz and F. Michel as guides.

ASCENTS OF MT. SIR DONALD IN 1900. BY GEORGE VAUX, JR.

WHILST nothing by way of novelty can be claimed for a third ascent, a few notes may not prove uninteresting, as supplementary to the narrative of M. Leprince-Ringuet, which appears in this issue of APPALACHIA.

Leaving Glacier House at 2.40 A. M., on July 11, 1900, a most promising morning, we followed almost exactly the descending route of his party. It was nearly eight A. M. when we reached the top of the névé of the small glacier lying at the base of the western face of the mountain. We here experienced great difficulty, and consumed over an hour in discovering a practicable route across a bergschrund of great width and apparently unfathomable depth. A possible way was at last found, but it involved a dangerous traverse across an exceedingly steep snow slope, which had become very soft and treacherous under the influence of the afternoon sun, by the time of our descent. After careful rock climbing, though in no place very diffi-

cult, we attained the arête at eleven, and after a rest reached the summit at 12.45 P. M. The weather conditions had now changed, and it was necessary to beat a hasty retreat amidst the appalling surroundings of a violent thunderstorm. Prudence compelled us to take shelter under an overhanging cliff to gain protection from the ice and stones which soon began to fall, loosened by the rain and wind. The total time occupied in the descent, including stops, was ten minutes less than six hours. It was evident that the route followed is the easiest so far discovered for the ascent of this peak, and brings the summit within fair climbing distance for a day's trip from Glacier House. On August 14, 1900, Sir Donald was climbed by Mr. J. Henry Scattergood, of Philadelphia, who took the same course. The bergschrund on this occasion gave but little trouble, as the guides were now familiar with the best way of overcoming it, and its condition was far less forbidding than it was a month earlier. Mr. Scattergood's time to the top was accordingly considerably less than mine.

A NEW PASS AT THE HEAD OF THE WEST BRANCH OF THE SASKATCHEWAN RIVER. BY CHARLES S. THOMPSON.

I LEFT Laggan at five o'clock Tuesday afternoon, August 6, taking Frank McNichol as cook and packer, with four horses, two pack and two saddle. Neither Frank nor I had ever been beyond the Upper Bow Lake, and our ignorance of the trail and our fear of meeting insurmountable difficulties if we lost it, made our outward progress a day slower than our return. The trail, however, from the Upper Bow Lake to the Forks of the Saskatchewan proved good, except in two places,—a very bad two hours' exasperating tumble through burnt timber on the northern side of the Bow divide, and a bad fault at a very large stream coming from the east about eight miles further north, where the trail with a quick turn disappears in the stream bed only to reappear two or three miles further down. *From the stream to Upper Waterfowl Lake, follow the right bank closely.* Taken all in all, the journey through the valley of the Little Fork from the Bow Divide to the Forks of the North Saskatchewan is the most pleasing valley trip in the mountains. The woods are for the most part well preserved, and as you approach the Forks, simply superb in their primeval simplicity. The mountains of the west, the Continental Divide, trace the western side of the valley with perpendicular cliffs; the mountains on the east, less precipitous, are strikingly modelled.

We came down to the Forks of the North Saskatchewan at dusk on the evening of Sunday, August 12. For a short space, just before

reaching the valley floor, the trail passes along the extreme edge of the Little Fork Canyon, and the view thus given of the surrounding mountains, apparently encircling the valley, and their height enhanced by its breadth, makes a picture of magnificent contrasts. Seen as we saw it, in the purple evening shadows, it was one not to be forgotten.

On Monday morning we crossed to the north bank, making three fords, the Little Fork, the Middle Fork, and the North Fork, in the order named, and in a semicircular route above their junction, in preference to swimming the North Saskatchewan, which is a river of the first order, immediately below their confluence. As it was, our horses were twice beyond their depth in the Middle Fork and once on the North Fork. The difficulty in crossing, however, was not so great as we had feared, and would present no difficulties except during the July floods. The trail up the east side of the North Branch is easily located by remnants of old Indian tepees prominently placed at its mouth, and followed with equal ease (except for a mile of burnt timber) for eight miles north under the precipice of Mt. Wilson. Then it comes down to the flood plains of the North Fork, over which it runs very indefinitely to the junction of the West Branch with the North Fork. However, the going — clay mixed with small stones — is good anywhere.

Mr. Thomas E. Wilson, of Banff, had advised me of some information that he had had from an Indian, that there was a pass suitable for horses over the Continental Divide at the head of the West Branch, provided the winter's snow had not been heavy, and Wilson himself said that he had been some distance up that valley, and that he thought there was a possibility of such a crossing. The Topographical Survey had no information regarding such a pass, and if it existed there was no record of its being crossed by a white man. I had originally proposed to cross the pass, if it were possible, to join Messrs. Collie, Stutfield, and Stevens, who were exploring up the Bush River on the west side of the dividing range; and when the shortness of my leave of absence definitely seemed to prevent the hope of such a meeting, I decided to adhere to a portion of the plan and ascertain if such a transcontinental pass existed.

We turned up the West Branch, a rather more considerable stream than the North Fork above the junction of the two streams, at four o'clock Tuesday afternoon, August 14, and slowly worked our way through the woods along the margin of the stream, camping about a mile and a half up, on a muddy flat. There was good water on the other side of the valley, but our side, the northern, was dry, and we were to our disgust forced to drink the milky flow of the Branch. On

Wednesday we had the choice of following the winding river through muskeags (the entire lower valley of the Branch for ten miles is a desolation of swamp, and, higher up, of stony flats) or breaking our way through the woods on a steep hillside. My former unpleasant experiences with mired horses led us mistakenly to choose the hillside. Progress was slow, owing to frequent ascents and descents to avoid fallen trees. Twice it seemed as if we could neither go forward or go down, but must either retreat or climb a thousand feet or so above timber line. It was better to try the muskeags, and at four o'clock we managed to get a lead down a gully that brought us safely again to the river. Progress was then really easy, and at seven we pitched our camp at an elbow of the river, and looked due south upon the Lyell group and glaciers, a really tremendous spectacle as seen through the cloud and mist of a heavy rain-storm. Having found the muskeags not formidable here, we drove our course the next day directly up the valley towards these glaciers, indifferent to the winding river, and fording it, horse belly deep, a dozen times during the day. We camped at night two miles from the foot of the Lyell glaciers, where a side valley leads directly west.

Friday, the 17th, it rained hard, but my time was so limited that we decided to find the pass that day if possible. We made the mistake of supposing it much nearer than it was, and, having much to do in camp, we did not start until half-past nine. An hour and a half of hard walking showed that the valley we were in headed in a great glacier coming down from the snow fields between Mt. Bryce and Mt. Columbia, and that our only hope for a pass lay in a col between the former mountain and an extension of the Lyell massif that made the southern side of the valley. It was problematical whether we could test this col by three, — it was then eleven, — and unless we made it by that time we were certain of a night in the wet underbrush without fire. I told Frank what might happen, and we agreed to put the matter to a finish. At one o'clock we broke down to the stream which drains the valley at a point directly beneath the col, where two streams come tumbling down the left bank in striking waterfalls. The lack of erosion at these falls was remarkable. It looked as if the streams were new at that point. The direction of our route now changed to due south, at right angles to our former route, as we climbed the hillside toward the col. Suddenly we looked down upon an exquisite turquoise blue lake (alt. 6500 feet) that lay across the foot of the col. Beyond the lake the land very abruptly rose in broken precipices, that echoed the sound of a waterfall. We were obliged to drop to the lake shore, where we found a well-worn animal trail. As these trails

always follow the line of least resistance, we allowed it to take us to the western end of the lake and up a stone slide in that south-west angle. As we climbed, it began spitting snow, and the mists dropped several points down the side of Mt. Bryce. It was very chilly. Once at the top of the rock side, we saw a rolling stretch of land sparsely covered with firs, intersected by irregular ledges that ran from Bryce toward the Lyell side. The intervening depressions were soft and mossy, an encouraging sign that we were near the uncertain parting of waters. The farthest ledge was the highest, and it looked as though from thence we might see something. We did. It was, as I have said, a cloudy day, but the rain had ceased, and everything below 8500 feet was visible for miles. We looked down a great gray tunnel over a great sweep of spruce wilderness, drained by a winding stream that apparently ran against a rocky ridge at right angles to its course ten miles away. From Mr. Collie, who, curiously enough, was not more than twelve miles from us that day, just around the hidden bend of this stream, I learn that this ridge marks the west bank of the Bush River, to which the valley's stream is tributary.

Sending Frank some distance down the Pacific slope, where some trees offered protection from the wind, I set up the camera in a desperate attempt to photograph a near-by glacier coming down from Bryce, took the altitude (7100 feet, aneroid) and the compass direction (N. 190 W.) and then ran down to Frank's shelter for a mouthful of chocolate and jerked beef. We arrived at the pass at three o'clock; we were tentward bound at half-past three, halting again on the watershed to drink British Columbia in one stream and Alberta in another, snapping the camera on the dividing ledge. We noted these facts: that the lowest point of the pass was nearer Lyell and about 300 feet below us, making the pass about 6800 feet; that spruce trees completely covered the lower portion; and that there was another lake just within the Alberta side, smaller but quite as blue as the one we first discovered. It was a race between darkness and ourselves all the way home, and not until we made the last mile in the dusk was I certain that we had won.

On Saturday we explored the Lyell glaciers, of which there are three, very fine and jointly larger than any I have yet examined, but separately not as fine as Peyto Glacier further south. As this glacier flows north and is well shadowed, the snout reaches the abnormally low altitude of 5500 feet, and there is a large extent of comparatively level ice before the ice falls begin (6500 feet). It is distinctly the lady's glacier of the mountains, and by beginning at the snout of the earlier glacier and going to the central ice fall, thence westward

to the foot of the western ice fall, it is, I think, possible to go five or six miles over easy dry glacier. On Sunday morning we began our return to Laggan, and arrived there the following Sunday morning, August 25, after an exciting crossing of the North Saskatchewan forks, and a delightful snow-storm — "quite like Christmas" — from the Upper Bow Lake to Laggan.

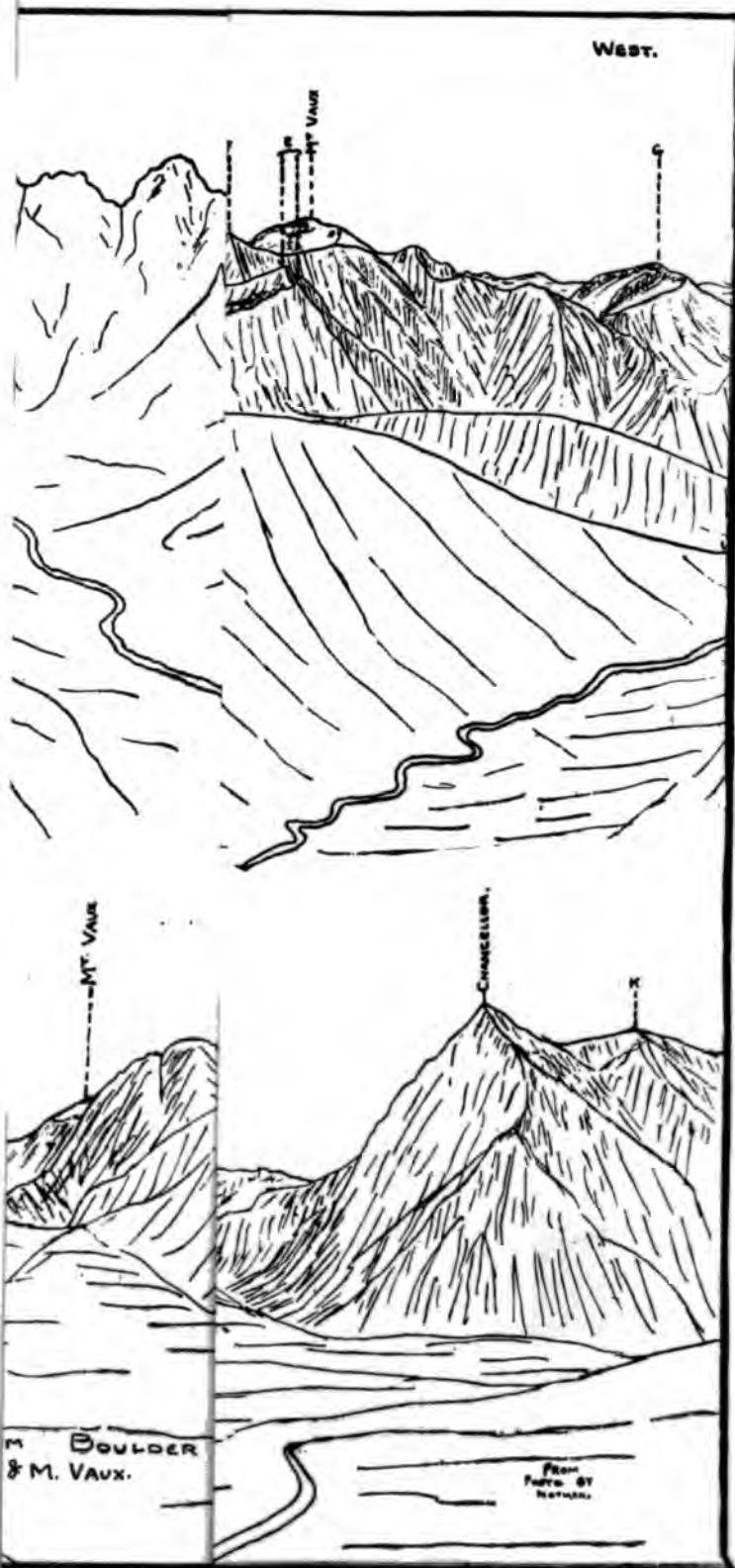
The weather was very uncertain, — only five perfectly clear days out of eighteen, — but as we had planned no high climbing we were not thwarted in any plans, and the wonderful cloud movements over the peaks and drifting mists over the mountains fully compensated for the delays that the wet caused us. In the woods a thorough soaking — provided you do not have to sleep in wet clothing — is far from disagreeable.

NOTES ON THE LOCATION OF MT. VAUX AND CHANCELLOR PEAK
(CANADIAN ROCKIES). BY J. HENRY SCATTERGOOD.

THE ascent of Mt. Mollison, situated near the headwaters of the Beaverfoot River, was accomplished by the guides Christian Häslar and Jakob Müller and myself on Aug. 20, 1900. The purpose of this expedition in the first place was to locate and ascend Mt. Vaux, but the prevailing ignorance of the true location of that mountain misled me so much that instead of making the ascent of it, we located and climbed another peak which I have since called Mt. Mollison. Inasmuch as there has existed in all quarters so much uncertainty as to the topography of the Ottertail ranges of mountains grouped around the two peaks Vaux and Chancellor, of which I had excellent views from the summit of Mt. Mollison, I venture to here supply a few notes, which I trust will clear up this question.

Although I could not make up my mind correctly while I was on Mt. Mollison as to the real position of Mt. Vaux, yet since that time I have received much light on the subject from a study of photographs of these mountains taken from no less than seven different positions, namely: (1) From a height northeast of the fork of Ottertail Creek, Fig. 1; (2) from Mt. Stephen, Fig. 2; (3) from hill south of Boulder Creek (not here represented); (4) from near Boulder Creek, Fig. 3; (5) from C. P. R. west of Leancoil, Fig. 4; (6) from Ice River valley, Fig. 5; (7) from Mt. Mollison, Fig. 6. From all of these ¹ it is very evident that in the rectangle bounded by the Kicking Horse, the Beaverfoot, including its mountain branch, and the Ottertail River,

¹ Profiles sketched from 1, 4, and 5 are appended to this number of APPALACHIA as Plate XXXIII., and those sketched from 2, 6, and 7 as Plate XXXIV.



there are *four* mountains, namely, first, Mt. Goodsir, second, the so-called "snow-dome" (Mt. Vaux), third, a "high sharp peak" (Chancellor), and fourth, Mt. Mollison, and that their altitudes are in this order.¹

Of Mt. Goodsir and of its location there has never been any reasonable doubt from the time that it was first seen and named, in 1858, by Dr. Hector. For a while, however, it was called "The Three Sisters" in the reports of the Topographical Survey, but in 1892 the original name of Goodsir was readopted.

About Mt. Mollison there has never been any reason for confusion, unless it might be, as is extremely unlikely, that it is Dr. Hector's "Pyramid Mountain."

But of the other two, namely, the "snow-dome" and the "high, sharp peak," there have very curiously been much uncertainty and error for many years. It seems, on the one hand, as if the snow-dome has been the only one to be remarked upon in the views from the north and from the east, and that the high, sharp peak has been by many entirely overlooked (it being visible only from a considerable height above Ottertail valley); and that, on the other hand, in the view from the west the peak known as the Chancellor has been the only one to which attention has been called. The impression has therefore been formed that there was only one high peak in the group and that what seemed a snow-dome from the north and east, appeared as a sharp rocky spire from the west, the explanation being that the spire was a western spur of the dome somewhat below the latter and yet concealing it.

No information can be obtained from any of the three maps that have been heretofore published. "Vaux" was a name used by Dr. Hector in his report to Captain Palliser, and Palliser located it on his, the earliest map. "But alas!" as says Professor Fay, "this map is utterly unreliable in matters of detail. We can only say that his Vaux is somewhere north of Goodsir and west of Lefroy. Sometimes Hector makes it in the Ottertail range, again he makes it the mountain south of Kicking Horse pass, from which the line of the watershed drops in crossing by the pass to take to the Waputehk mountains." Neither can one learn from Dawson's map² that there are two mountains; he has apparently placed Vaux in the position of the high,

¹ There are high points upon the connecting ridges, notably those marked A, B, (C), E, F, which are almost as high or higher than Mt. Mollison. These, however, do not seem to stand out as *separate mountains* in the same sense as the four here mentioned, either forming a part of one of them or a portion of a ridge.

² Reconnaissance map, Geol. and Nat. Hist. Survey of Canada, 1885.

sharp peak (making its altitude 10,340 ft.), and has omitted the snow-dome, which is higher, and the name "Chancellor." Nor on the third and latest map, that of Drewry and McArthur,¹ are two peaks tabulated; this map definitely marks the Chancellor as the snow-dome, merely outlines the high sharp peak and entirely omits the name "Vaux." It is very natural, therefore, that the theory that there is only one peak should have been held by some. Its name seems to have been fixed by the Canadian Pacific Railroad from the west as "Chancellor," and its location by the map-makers as that of the snow-dome. The real situation, with names properly applied, does not seem to have been understood. Recently, however, T. E. Wilson of Banff and F. M. Bell-Smith of Toronto have realized and have privately stated that the Chancellor is not the same as the snow-dome, but that it is the high, sharp peak further south, and that the snow-dome therefore is a separate mountain, which can properly and separately be called Mt. Vaux. According to the Topographical Survey this naming of Chancellor and Vaux has been exactly reversed, they considering the Chancellor the same as the snow-dome (as on Drewry and McArthur's map), and Mt. Vaux as the high sharp peak (which on the map is not named at all). A close study of the various photographs, however will show that this is a theory that is not tenable.

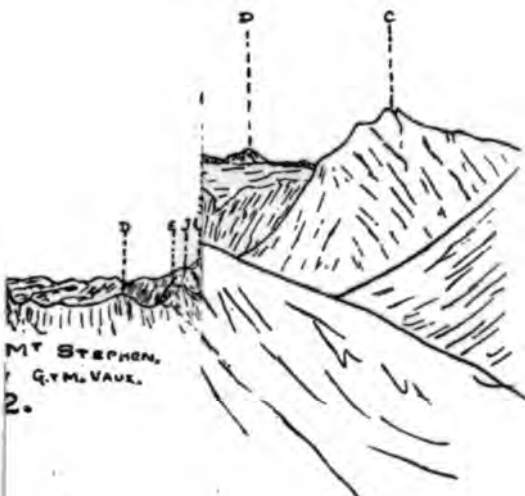
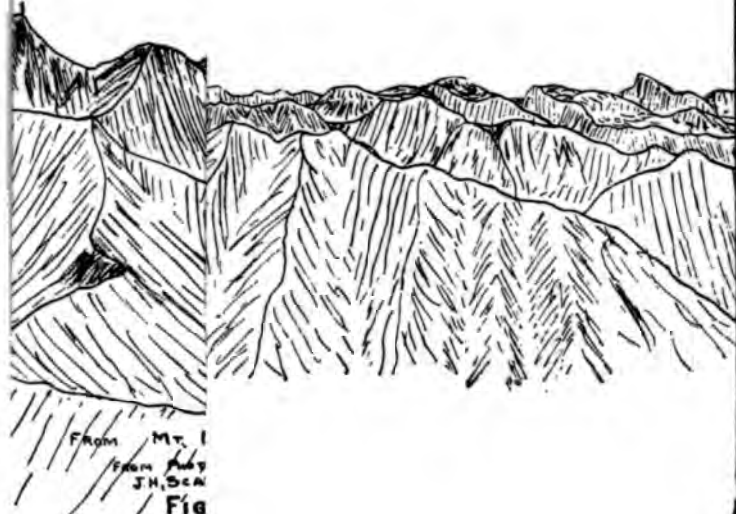
The various figures accompanying these notes show that the Vaux-Chancellor group of the Ottetail mountains is joined with Mt. Goodsir by a high divide which separates the Ice River valley from the Ottetail valley. The north side of this divide is steep and rocky, and besides the glaciers on the northern face of Mt. Goodsir itself, contains a narrow glacier which quite fills up the steep ravine to the east of the double summit marked C, the stream from which flows into Ottetail Creek. A glacier upon the lower mountain north of Mt. Vaux, the one marked G, also sends its waters into the Ottetail. The south side of this divide supports the great ice-fields that come down from the dome of Mt. Vaux, and which are mentioned by Dr. Dawson as lying at the head of Ice River; in fact they form the middle source of that stream.

Another high divide, marked I, connects Mt. Vaux and its shoulder H with Chancellor Peak, and serves the double purpose of, first, a watershed between Ice River and the stream which flows into the Kicking Horse at Leancoil, and secondly, of a retaining wall for the great glaciers of Mt. Vaux. The western source of Ice River rises in a glacier upon the eastern flank of Chancellor Peak, and the eastern

¹ Report of the Dominion Topographical Survey, 1892.

Mount Gossage.

EAST.



branch in the depression between the double summit marked C and the outlying spurs A and B of Mt. Goodsir. I was unable to see whether or not a glacier exists at the head of this depression.

As regards the feasibility of a route up Mt. Vaux, it appears that the gently sloping glaciers must furnish the easiest course; I think it will prove possible also to reach these glaciers from either the Ottertail or Ice River valley. The Chancellor looks as if it might be climbed by direct ascent from a little south of Leancoil, but certainly the longer course by way of the range and peak K is easier. The ascent of Mt. Goodsir will furnish a magnificent climb. Its rock appears to be of the same hard nature as that which forms Mt. Mollison, and no doubt is split by cleavage in the same manner. If this is the case, it ought to be possible to find a way up the highest tower from either the Ice River or Beaverfoot side, though no doubt it will be a very long rock climb. Any approach by way of the northern precipices, however, seems out of the question.

In the map accompanying my article on the ascent of Mt. Mollison, the spurs of the Ottertail group of mountains are specially marked with letters, whose interpretation can be found in the several figures of Plates XXXIII. and XXXIV. The letters, beginning with A at Mt. Goodsir, follow consecutively along the connecting ridge to Mt. Vaux, then to Chancellor Peak, and end in the lower Ottertail range with K.

New names appearing on this map are Mt. Mollison, Helmet Mt., Mt. Sharp, Wash-ma-wapta Glacier, McArthur Lake, and Cathedral Spire. I have called the lake which Mr. McArthur describes in his report of 1892 as being near Cataract Pass, after him, because he discovered it and probably is the only one who has ever seen it. It is described as lying at an altitude of 8000 feet, or 500 feet above the level of the pass. As regards the name Cathedral Spire, it seemed advisable to overcome the present uncertainty as to whether the name "Cathedral Peak" applies to the pinnacle rocks seen above the C. P. R. or to the higher summit a mile and a half further south, by especially distinguishing these crags by the name Cathedral Spire. Both are really parts of the same great massif, and can quite properly bear the same generic name.

Reports of the Councillors for the Autumn of 1900.**Improvements.**

BY PARKER B. FIELD.

WHEN the present Councillor assumed charge of this Department three years ago, the surplus funds of the Club were largely invested in certain business enterprises and but little money was available for the promotion of work on the paths and camps. As this condition had prevailed for some years, the Councillor found a much larger amount of work awaiting him than could possibly be executed in one or two seasons. Appropriations to his Department have increased, however, each succeeding season, until, at the close of this year, with an appropriation of \$275, to which has been added \$25 subscribed by the Excursion Committee for work in connection with the Field Meeting, he is able to report that, to the best of his knowledge, every Club path, with the exception of one, and each of the five camps is now brought up to the Appalachian standard of excellence and is a credit to the Club. This standard varies, however, according to the importance of the route. Of the first grade, the Tuckerman's Ravine path is a type. This is a trunk line, and at present the only path from the Glen road to Mt. Washington, and it is thoroughly cleared of all incumbrances. At the other extreme may be mentioned the Cascade Ravine trail in Randolph, an alternative route for those who enjoy a rough scramble beside an enchanting brook. This is left as far as possible in its natural state, but with plenty of blazes to mark the way and bushes cleared which impede progress. Again, in more remote regions, we have the simple blazed trails through the forest. Even there, however, the path is well cut where dense scrub is encountered. In no case has the Club undertaken to make the smooth graded paths or so-called "boulevards." Such work is left to others who have more time and means at their disposal than the Club can afford.

This season axemen have been over seventy-five miles of Club paths, covering all excepting the Mt. Liberty path, five and one half miles long. Early in the season it was reported to the Councillor that lumbering on Mt. Liberty was not completed,

so nothing was done upon the path, and it was not until fall that he learned that this was a mistake. It was then too late for action this year.

Besides the ordinary repairs of damage incurred last winter the following work has been accomplished by the Club.

The Mt. Willey path, which was obscure at its entrance and obliterated by lumbermen above the Brook Kedron, has been cleared by men gratuitously furnished by Mr. C. H. Merrill, manager of the Crawford House. Working with the Councillor, they spent a day on the mountain, and signs have been put up distinctly marking the entrance and course of the path.

On the Castellated Ridge of Mt. Jefferson, Eugene Hunt of Randolph was directed to run a line of cairns from the former terminus of the Club trail at the lower Castle up to the summit plateau. Descent in fog by this route has thus been rendered safer.

The Cascade Ravine trail has also been cleared by Mr. Hunt.

The most important Club work in Randolph has been the opening of a new path to the Pond of Safety, to supplant the old path, which was adopted as a makeshift until something better could be devised, and was swampy, unsightly, long, and disagreeable, and is now abandoned. The new path was laid out in June by the Councillor, who explored the region with Vyron D. Lowe, of Randolph, and the path was cut out by the latter in August. It starts from a point on the old route known as the Mt. Washington View-Point, as from it the buildings on the summit of Mt. Washington are seen, apparently resting in the col between Mts. Adams and Jefferson. This point is reached by an excellent path (not a Club path) from the Randolph hotels. From this view-point the Club path extends almost due north over the ridges of Randolph Mountain to a logging road near the pond, which it follows for three eighths of a mile to the sawmill site, then around the pond to its farther side, where a view of Adams and Madison is obtained, across the pond. Many have felt in years past that this view alone has rewarded them for the disagreeable walk over and back. The new path affords inspiring views of Lafayette and the Pliny and Pilot ranges, as well as the cone of Washington, well raised above the Adams-Jefferson col. It is well

watered at short intervals, yet affords perfectly dry walking. Several enthusiastic and unsolicited letters in praise of this path have been received. Mr. Eugene B. Cook has done much valuable work on the path, measuring and marking the eighth-mile points. He finds the distances approximately as follows: Ravine House to first Mt. Washington View Point, two and three eighths miles; to view point at the Pond, four and seven eighths miles. Thus the Club path is two and one half miles long. The path has cost \$36. Of this the Club has paid \$17, and the remaining \$19 have been generously subscribed by Mr. W. H. Peek, Mr. E. B. Cook, and Miss E. W. Cook.

On the Carter-Moriah range lumbering operations have ceased, so the path has again claimed attention. As the path from Gorham to Moriah has been very seriously cut into by the lumbermen, and visitors at Gorham have constructed a new path starting near the suspension footbridge, the old Club path to Moriah is abandoned. Over a mile of the path between Mt. Moriah and Imp Mountain has been burned over by the Wild River fires, rendering a relocation necessary. The Carter-Moriah path now begins at the summit of Mt. Moriah, and, passing below the burned area, keeps along the westerly slope of Mt. Moriah until Imp Mountain is reached. From here through to Carter Dome the old path has been cleared. Imp camp has received a new roof. The work on path and camp was done by T. S. and V. D. Lowe, of Randolph. In June it was found that a portion of the roof of Carter Notch camp had been removed, probably by an act of vandalism. The damage was repaired, and the roof was tight during the summer, but information has just been received that another piece has been torn off. The Glen-Carter Notch path crosses several heavy corduroy bridges left by the lumbermen. These are fast rotting out, and after sustaining the snow of another winter some of them will become unsafe. Next season they will need partial rebuilding.

In the report of last year a path over Boott Spur was advocated. Upon careful study of the Spur in June, it was found that the route proposed would be too steep to become a trunk line, and would involve great expense if extended downward toward the Glen from the timber line; consequently it was laid

out to connect the Crawford bridle-path with Hermit Lake camp, and it proves a most attractive return route for persons who have passed up through Tuckerman's Ravine. The work was done by T. S. and V. D. Lowe and the Councillor, and the following bulletin was posted at the Summit House : —

BOOTT SPUR TRAIL.

This path was laid out by the Appalachian Mountain Club in June, 1900. It affords the most comprehensive view which may be obtained of Tuckerman's Ravine and the basin of Hermit Lake, and the rugged grandeur of the view from the Overhang Crag is hardly surpassed in the mountains.

Leaving the Crawford bridle-path at a point a short distance south of the cone of Mt. Washington, it follows for a mile the ancient Davis trail at a comparatively level grade to the crest of Boott Spur, and may thus far be safely traversed by any novice who adheres closely to the line of cairns which mark the path. From the summit of the Spur, the path dips steeply over rough and somewhat treacherous boulders to the grass below, and, a few rods further on, passes near the Overhang Crag, which is well worth the visit of persons with steady heads, but it should be approached with greatest caution.

From the Crag the path very rapidly descends for half a mile over the open crest of the ridge, with patches of scrub on either hand and some loose and tipping stones under foot.

Arriving at a lofty plateau commanding a view of the entire Gulf of Slides as well as Tuckerman's Ravine, the path turns to the left and drops steeply off, first over more loose stones and then through a channel in the high scrub, to the basin which contains Hermit Lake, some 1500 feet below the Overhang Crag. Crossing two branches of Cutler's River, the path rises slightly, and a few rods beyond reaches the path from the Ravine to the Glen road directly opposite Hermit Lake camp, and some half dozen rods below the lake. The total length of the trail is about two and one half miles.

The ascent of this path is attended with less danger from tipping stones than is the descent.

Convenient accessories to the Hermit Lake camp have been arranged, and it is now as comfortable as any Club camp, and, in the opinion of some, the most attractive of all. The icy cold water supply is abundant in the driest weather.

The Twin range is now deserted by the lumbermen, and the path is again cleared. The lower part having been destroyed

by the loggers, it was necessary to relocate it. The new path starts from the track of the abandoned Little River lumber railroad, at a point just below Camp 3 and some four miles from the Twin Mountain House. Crossing a footbridge, and climbing for about half a mile through the débris left by the lumbermen, it reaches the forest and at the same time the original path, which is then followed for two miles to the top of North Twin, or a mile farther to the summit of South Twin. To this point there is a good broad path, cut by two men generously furnished by Col. W. A. Barron, manager of the Twin Mountain House. Any person with a fair knowledge of the mountains may easily follow the path thus far (three and one half miles), and will be well rewarded with grand views in all directions.

Beyond the South Twin none but the experienced mountaineer should go without a guide, and water should be carried, as there is none on the crest of the ridge.

The path continues from the South Twin as a blazed trail only, and passes over the crest of Mt. Guyot and onward to the sharp cone of Mt. Bond, about four miles beyond the South Twin. Bond is the most southerly peak of the range, and affords comparatively near views of the great swelling bulk of Mts. Carrigain and Hancock. Here ended the original path, but the trail is now continued onward four miles to the forks of the Pemigewasset River, where it ends in the heart of the primeval wilderness, about fifteen miles from the Twin Mountain House and some ten miles from the Crawford Notch, Livermore, and North Woodstock, the nearest points of civilization.

From here the only way out is by the river bed, down stream to North Woodstock; or up the South Fork and through the Carrigain Notch, then down to Livermore, which is two and one half miles from Sawyer River station, in the Saco valley; or, a third alternative, up the North Fork four miles to Thoreau Falls, from which there are two routes outward, — one down the abandoned lumber road through Zealand Notch ten miles to Zealand, the other up the same road and by paths across a lumbered district by Willey Pond and out to the Crawford Notch at Willey House station, six miles from the Falls.

The only water between the lumbered area on the North

Twin, and the termination of the path at the Forks, is to be found five minutes to the east of the path in a gully between Mts. Guyot and Bond. A sign on the trail indicates the route to this water. Canteens are indispensable.

If desirous of making an early start, comfortable bunks may be found in the abandoned lumber camp 2, less than a mile below the beginning of the path.

Those who wish to visit this region should do so very soon, as the lumbermen are likely to begin operations in this valley in about four years.

The new path was laid out by the Councillor, and the work was placed in charge of Edward N. Haynes, of Twin Mountain, who is an excellent guide for this region.

One more change in the Club paths is the establishment of Passaconaway Loop. The path up Passaconaway is maintained by the Wonalancet Outdoor Club to the point where the path from Whiteface joins it. Here the Club path constructed last year branches to the left, and, passing the new Passaconaway Lodge, goes directly to the summit. The older and more circuitous Club path, from the old camp (now abandoned) to the summit, makes a very attractive addition to the new path; so it has been arranged that the link of path between the abandoned camp and the Whiteface path be ceded to the Club, thus forming a circuit passing over the summit. The whole has been put in order and adopted by the Council under the title "Passaconaway Loop." No repairs were necessary on the new Lodge, but the short path to the spring was made more plain for use after dark.

The lumbermen have begun their operations on the Waterville side of the American Institute of Instruction Path, from Waterville toward Livermore, and as it is already devastated on the other side, it is practically doomed. This year it was reopened through the lumbered district, but next winter the ruin will probably be complete. Mr. A. L. Goodrich, president of the Waterville Athletic Association, recommends that it be abandoned and that a new path be opened to the Livermore lumber railroad by way of the Greely ponds.

The Madison Spring Hut has, as usual, been thoroughly renovated. The blankets have been carefully examined, and several

of the older ones taken out of commission and stored under the eaves for use in possible emergencies. The better blankets have been washed, and six new ones have been added, also six new candle lanterns and a large supply of candles. A new folding table has been placed in the hut, and four stools should be supplied another season. They were not to be found in the local stores this year. Though a somewhat expensive luxury at such an altitude, a wooden floor would add much to the comfort of the hut. This should be grated and removable in sections.

The committee appointed last year at the request of the Councillor, to advise him in regard to better rules for the hut and a more satisfactory enforcement of the same, could suggest no changes in the rules, but recommended that a footnote be added requesting their enforcement by rightful occupants. The rules with appended note were posted at the leading resorts of climbers, and the former evil of overcrowding has been reduced to a minimum, knowledge of but three instances having reached the Councillor after diligent inquiry. On one occasion, however, the rules appear to have been misinterpreted, and a person or persons really needing refuge and entitled to it descended the mountain, gave out before reaching the valley, and spent the night in the woods.

The opinion has been expressed that these rules deal too harshly with late arrivals; but it must be borne in mind that those really in distress are always welcome, and that the rules are especially designed to prevent the wanton and often excessive overcrowding which has obtained in the past. The Councillor has always gratefully received suggestions for the improvement of the rules, and his successor will undoubtedly be pleased to perfect them.

The rules, as posted, are as follows: —

MADISON SPRING HUT

This stone hut is situated in the col between the peaks of Mt. Adams and Mt. Madison, and is the property of the Appalachian Mountain Club.

The Hut is primarily a refuge for those who are exhausted or unavoidably overtaken by darkness or storm, but, except when official

notice is given to the contrary, its more general use, *up to its capacity of ten persons*, is offered, regardless of Club membership, under the following conditions : —

Parties moving together and expecting to occupy the Hut at night should consist of *only a few persons, perhaps three or four*; the larger the party the more important is it to arrive before sundown.

Privileges to occupy the respective bunks are to be secured in order of individual arrival, *not by proxy*; and constructive presence is to be maintained by conspicuously posting the *name, date, and time of arrival* upon the bunk selected.

Those who have occupied the Hut the night preceding must give place to any others who arrive before sundown.

Persons who have not made reasonable effort to fulfil these conditions are requested not to crowd the Hut to the discomfort of its rightful occupants; but the latter are asked to remember that this is a place of *refuge* and that humane consideration must be shown for any who may be forced by *unavoidable* circumstances to remain at the Hut without having secured adequate accommodation.

Note. — It is to be regretted that the hospitality of the Club to all comers has been abused by persons having full knowledge of these rules. Should these conditions continue, more stringent measures must be taken. Rightful occupants are requested to insist that the Hut shall not be overcrowded. It is about three and a half miles to the Ravine House, Randolph, by an excellent path, and any belated party may be furnished with one lantern for the descent, the same to be left with the clerk at the Ravine House. Occupants will please note in the register the name and address of the leader of each party which is obliged to descend in this way.

The shocking fatality on Mt. Washington last summer brought forcibly to mind the need of some sort of refuge on the Crawford bridle-path, and at a Council meeting held at the Summit House in July the President and Councillor of Improvements were constituted a committee to consider the matter and take necessary action. A circular appealing to the public for funds was soon sent to the mountain hotels, but as yet the subscriptions have not warranted procedure with the work. It is hoped, however, that the money will be raised in time to begin operations next June.

In 1893 a special committee assisted the Councillor of this Department in determining just where the Club should assume

responsibility for paths and camps. A list was then made, and paths and camps have since been added by vote of the Council. It appears that the understanding is not general as to just which paths and camps are included in this list; so a table has been compiled showing the location of each, and containing facts which may prove of interest. The distances are in many cases only estimated, and references to APPALACHIA are made only when it is thought they may be useful to persons about to visit the region.

The table is appended to this report, and copies have been printed which may prove of value if posted at the various mountain hotels.

As all the Club camps and paths, excepting one, are now in good order, they can be kept so with vigilant oversight at a comparatively small cost, and there is therefore opportunity for an extension of the work of the Department. The only persons besides the axemen who derive pecuniary benefit from Club paths are the local hotel proprietors, and it has been the custom of the Councillor, when contemplating any important work, to request the more opulent of these to contribute funds or men, and a cordial and generous response has been received in every instance. In new work the Councillor is confident that his successor may rely upon cordial coöperation from this source.

We would recommend that during the next season early attention be given to the Mt. Liberty path, the bridges on the Glen-Carter Notch path, and the possible relocation of the route from Waterville to Livermore.

The Committee of 1893 decided that the Humphrey's Ledge path, presented to the Club in 1884 by Miss E. J. Baker, had been superseded by the carriage road, and that it was not advisable for the Club to longer maintain it. During the present winter the Councillor has been requested to reopen this path, and he advises that consideration be given to the matter. The donor will cheerfully assent to the decision reached.

It is reported that active lumbering operations are in progress on the easterly slope of Mt. Washington, and that a long section of the Raymond path which connects the carriage road with Tuckerman's Ravine has been obliterated. This year, in preparation for the Field Meeting, the Raymond path was

cleared from the terminus of the Club path to the snow arch. On the head wall of the Ravine avalanches have destroyed a portion of the path, rendering the passage dangerous. Much time was spent by the Councillor in an unsuccessful endeavor to find a new and better route up the head wall. The ravine on the right of the snow in ascending was thoroughly explored, but, owing to the unusual mass of snow as late as June 30th, it was impossible to examine the head wall on the left side. If a good route can be found on this side it would seem advisable to arrange, if possible, for the Club to adopt the Raymond path from the point where its present path ends to the Snow Arch, and then to construct a new path up the head wall, and continue it onward to the summit, supplanting the present painted trail with one distinctly marked by cairns.

The use of paint on the face of nature should be tabooed. Not only does it seem to us a desecration, but on the rocks it is worse than useless after a light snowfall, and nearly so in a fog, and on the trees it is of no avail in the night, and at all times less distinct and durable than the blaze of an axe.

If the present Waterville-Livermore (American Institute of Instruction) trail is discontinued, the only line of communication between Albany and Waterville will be cut off. Club members and others who visit "Shackford's" in Albany have already asked for a more direct path than the present one, and this matter should receive due attention.

A camp in the wind-swept Adams-Jefferson col would prove of great value and relieve congestion at the Madison Spring Hut.

A path from Webster to Jackson would complete a most convenient circuit from the Crawford House, and if this could be continued over the two summits of Clinton to the Crawford bridle-path it would prove very attractive. The Councillor walked over this route last summer and started a string line for such a path, but the string supply became exhausted half way to Mt. Jackson.

An inexpensive shelter at the forks of the Pemigewasset River would prove an incentive to many to take this rare two days' trip over the Twin range and through the forest primeval, now doomed by the lumbermen to destruction in about four years.

We would also mention as desirable the reopening of Dr. Worcester's path from North Moat over the range to South Moat, and its extension to the Albany road; the construction of a path from the Pond of Safety to the head of the Ice Gulch, making a fine circuit from Randolph; and the erection of observatories on Passaconaway and Carrigain.

The sphere of influence of the Club might be much extended if new work were done in regions where we now have no paths, notably the region west of the Franconia Notch, the Albany intervale, Bartlett, and along the Maine boundary.

A most valuable work, in which the aid of members might be enlisted, would be the accurate measuring and marking of all Club paths.

About the usual number of record rolls on mountain tops have been removed and replaced, and the new type of cylinder appears to be a success.

The following activity in path and camp improvements outside the Club work has been reported to this Department.

About Randolph. — Mr. J. Rayner Edmands reports that the most conspicuous feature of work done by his men is the graded Short Line extension to Mossy Fall, effecting a marked saving of time and effort on the way to the floor of King's Ravine. The usual contribution to smoothness on the Gulfside trail was made during the short interval after the frost was gone, and before the bunks at Madison Spring Hut were needed for pedestrians. A new cross-path, called Upper Bruin trail, has been opened as a graded way by which a route to Adams combines the interesting "Knife-edge" portion of the Air Line with more than three miles of smooth walking on the Valleyway and Madison path, and the steeper upper portion of the Valleyway is avoided. The difficult grading of the Randolph path, above and below "The Perch," has progressed. The Short Line branch has been opened from about five eighths of a mile up Madison path, across the Air Line, at the western end of Beechwood Walk, to the Short Line proper. On Madison path a graded walk has been made across the field and into the woods just above Appalachia station. This bit was forbiddingly rocky, and heretofore the use of the area for pasturing horses made expensive grading hardly worth while. The three improve-

ments last named lie upon the graded route from the Ravine House toward Mt. Washington. Where it diverges from the Air Line in the field overlooking Appalachia station a large post has been erected bearing carefully worded signs.

Mr. E. B. Cook has constructed a short cut-off from the Air Line to its King's Ravine branch, thus lessening the distance to King's Ravine and obviating a climb up and down the ridge.

Mr. Louis F. Cutter's promptness in keeping his blue-print map of northern slopes of Madison, Adams, and Jefferson up to date is a valuable contribution toward the effectiveness of all improvements within that section.

In Gorham. — Messrs. I. E. Vernon and W. W. Hart have opened a first-class graded path from a point near the suspension footbridge to their private camp, just below the summit of Mt. Surprise. Next year they expect to bring up to the standard of the path below the continuation of this path, over Surprise to the summit of Mt. Moriah. Mr. Vernon reports that he is endeavoring to arouse public enthusiasm in regard to work on paths, and the Councillor has recommended that he form a local improvement society.

Mr. B. B. Bickford has constructed on Mt. Hayes, just below the summit, an open shelter camp about ten by fifteen feet, to which the public are welcome.

Mr. C. H. Merrill, of the Crawford House, has had the scrub cleared from the Crawford bridle-path, but the work of reconstruction on the lower part has been suspended.

The Wonalancet Outdoor Club, of Tamworth, has placed many signs on the paths constructed last year, but their most important work has been that of blazing a trail from the summit of Whiteface to the top of South Tripyramid, thus forming a new connecting link between Tamworth and Sandwich on one side of the range, and Waterville on the other. The path must be about two and a half miles long.

The North Woodstock Improvement Society report a path opened to the summit of Barron Mountain; also another path (the fifth) on Mt. Cilley. It starts from the Warren road and passes around Elbow Pond.

The Waterville Athletic Association, discouraged by the lumbermen, has done no work.

The most extensive work done by an individual is that of Mr. John Anderson, manager of the Mount Pleasant House, who has opened two important routes.

His bridle trail over the Rosebrook range is graphically described in the White Mountain Echo of September 1st. The path starts from the Maine Central Railroad track, near the brook which passes the Mt. Pleasant House bowling alley, and mounting nearly to the summit of Mt. Stickney, crosses over to Mt. Echo, and passing over that summit, descends to the Crawford House, a distance of about six miles. There are branch paths to the summit of Mt. Stickney and to the Zealand Notch. The views which are obtained in every direction are described as exceptionally fine.

The old path of 1819 to Mt. Pleasant has been reopened by Mr. Anderson with some short cuts and changes. The finding of the route, rod by rod, in spite of lumbermen's clutter, was done by Mr. J. R. Edmands. The path starts on the right of the turnpike road to Base station before the Twin River railroad crossing is reached, and runs to the railroad track. A short distance to the right, down the line, it commences again on the other side, leaving the rails at the eastern end of the cut, just east of the long tangent which points toward Mt. Pleasant, and perhaps half a mile west of the Twin Rivers crossing. The A. M. C. route of 1886 left the track just west of the cut referred to. The new path approaches the mountain by an easy gradient until it reaches the ancient zig-zag route up the steep mountain-side, and it finally emerges on the south side of the cone, and joins the Crawford bridle-path.

Mr. Anderson has also nearly completed a carriage route from the Mount Pleasant House farm to the lower Barron & Merrill lumber camp. Thence it follows the lumber road to the base of Mt. Pleasant, where a footpath branches steeply upward to the left, and soon reaches the reopened path. The carriage road is to continue into the depths of the ravine between Mts. Pleasant and Clinton.

A detailed account of this route with rough sketch map is in the custody of this Department for reference by persons interested, and other particulars may be found in "Among the Clouds" of September 14th.

In closing his work the Councillor desires to gratefully acknowledge the valuable assistance rendered him in supervision or work upon paths by Messrs. E. B. Cook, J. R. Edmands, W. H. Peek, W. G. Nowell, L. D. Goulding, and Howard Clapp, Miss Katherine Sleeper, and Mrs. S. B. Elliott; the entertainment and woodsmen gratuitously furnished by Colonel W. A. Barron and Mr. C. H. Merrill; the generous donations contributed by Messrs. Cook and Peek, Miss E. W. Cook, Miss Anna M. Fellows, and Mr. Paul Dudley Chase; the clerical assistance of Miss A. E. Lanning, and the cordial coöperation and advice given by many more.

Report of the Room Committee for 1900.

Our pleasant rooms in the Tremont Building are as attractive to our members as in past years, a fact which is attested by the registration of about five thousand names. This register gives, however, at best an incomplete census, since nearly half the visitors depart without having left any evidence of their presence. The rooms have been open on week-day afternoons throughout the year, July and August excepted, under the care of volunteer custodians. Even in the summer months hardly a day has passed without the registering of one or more names, so that the actual use of the rooms has extended to fully three hundred days.

The first "at home," that of the Room Committee, was held on January 15, and on May 16, President Perry met here the members of the Club, to the number of three or four hundred. Reunions of the various excursion parties, some six in all, have been held in the rooms, and a new feature has been introduced — the bird-show. There were two of these under the care of Mr. W. R. Davis, and they were most interesting and successful occasions.

Committee meetings, to the number of one hundred or more, including those of the Council, have been held in the rooms, and also the well-attended annual and business meetings of the Snow-shoe and Bicycle sections. Other associations, which have in part the same membership as the Club, have been afforded the opportunity to hold evening meetings in the rooms, and among these societies may be named the Massachusetts Forestry Association and the Teachers' Geography Club.

JOHN RITCHIE, *for the Committee.*

Report of the Excursion Committee for 1900.

THE novelty of the year in the way of Excursions was the September walking trip, while the sub-committee having the Outings in charge has

been able to find quite a number of places new to Club members. Among these may be mentioned the glacial ridges near Hyde Park, Penn's Hill in Quincy, Telegraph Hill in Hull, World's End, Hingham; Bear Hill, Reading; Monatiquot Valley; High Rock, and Sandy Valley, in Dedham; and Pine Hill, the easternmost of the Blue Hills. These and other regions have become accessible to Club parties through the medium of the newer lines of electric cars.

Nine Excursions were taken during the year, reports of which are here given, and forty-six Outings.

The Winter Excursion, February 17-26, was planned and conducted by the officers of the Snow-shoe Section, Messrs. W. R. Davis and R. B. Lawrence, according to the custom of past years. The Iron Mountain House in JACKSON was again the headquarters of the party, which numbered seventy-five. During the ten days various parties made trips to Thorn Mountain, Doublehead, Carter Notch, Iron Mountain, Giant Stairs, Tuckerman's Ravine, and Kearsarge, while a large number went by train to Crawford's, and made the ascent of Mt. Willard. During the week smaller parties, numbering in all nine persons, made the ascent of Mt. Washington.

The party making the Excursion to CHOCORUA left Boston on Saturday, May 26, at 1.20 P. M., reaching West Ossipee at 5.10, and arriving at Chocorua House at 6.15 P. M. The next morning a start was made for the summit *via* the Hammond path, the wraps, etc., being carried up on pack horses by the Liberty path. The day was very warm, the thermometer registering 75° in the shade at the summit. A party of thirty-three spent the night at Mr. Knowles's little house, the others returning in the afternoon.

Monday was spent in climbing about the peak. Quite a large patch of snow was found on the north side of the summit, and a considerable quantity of trailing arbutus. The eclipse of the sun as viewed from Chocorua was not a great success, as but few glimpses could be obtained through the clouds. The party returned to Chocorua House in the afternoon, some by the Liberty path, and others by the Hammond trail.

Tuesday, the 29th, wagons were taken to the Chase farm, from which a fine view was obtained, extending from the south peak of Moat around to Kearsarge. Several spots of snow could be seen on Mt. Washington. Returning, the party stopped at Whiton's Pond for lunch, spending the afternoon in rowing about the lake.

Wednesday, Decoration day, a drive was taken for "Lonely Lake" and Wonalancet Falls, returning in time for dinner. The party left for Boston at four P. M. Several members of the Club arrived on Tuesday evening, climbing Chocorua the next morning, and returning with the others. The party numbered forty-seven, and the trip was conducted by Mr. Charles E. Lord.

A party numbering more than forty left Boston on Friday noon, June 15, reaching the Muschopauge House, RUTLAND, after a pleasant drive from a minor station on the railroad a few miles distant from Rutland. Accessions

by other trains and conveyances increased the total number to fifty-seven. On Saturday nearly the whole party drove to PRINCETON and ascended Wachusett, this being the Club's first visit since the acceptance of the mountain for a public reservation. Sunday afternoon was devoted to an inspection of the State sanitarium on Rice's Hill, in which an excellent showing was made of the methods and results in the treatment of consumption. On Monday a large party made the ascent of Asnibumskit in Paxton, and on Tuesday most of the excursionists returned to Boston. The trip was a very successful one, the weather was enjoyable, the views were delightful, and the country was pink with mountain laurel. The excursion was conducted by Mr. C. L. Burrill.

The Thirty-fifth Field Meeting of the Club was held at the SUMMIT OF MT. WASHINGTON during the week from June 30 to July 7, this being the third gathering of the Club at this place. There were ninety-seven members and guests in attendance. The majority of the party arrived Saturday evening, June 30, in the midst of the memorable storm which gave to them a valuable and impressive lesson on the uncertainty of mountain weather, and the necessity of precautions on the part of mountain climbers.

Three sessions for the presentation of papers were held during the meeting, on Saturday, Wednesday, and Thursday evenings respectively. The proceedings of these meetings are included in the Proceedings of the Club.

Saturday night and all the next day the storm raged so that no one ventured out of doors to any distance, the little run across the platform to the printing-office in the next building having in it a spice of adventure and uncertainty. Late Saturday night it was impossible for one person to stand up against the wind, and parties of three or four with linked arms were practically helpless to guide themselves when out of the lee of the hotel. The frost-feathers of Sunday and the strange accumulations of ice which encased the projections at the summit were novel to nearly all the party, and furnished amusement which was by no means devoid of educational element. Through Saturday, and more or less on Sunday, ice-balls were driven against the windows of the Summit House to the detriment of the glass, until some sixty or seventy panes had to be replaced by less fragile wooden substitutes.

On Monday, Tuesday, and Wednesday each a party set out across the northern peaks, climbing all of them, and spending the night in the Madison hut. These parties numbered in the aggregate twenty-eight, exclusive of the guides.

On Monday, July 2, the storm having passed away, three parties were made up, the Club hut group under the leadership of Mr. Ritchie, an all-day party of forty for Tuckerman's Ravine, with Mr. Newcomb at its head, and one to the Alpine Garden. During the afternoon the bodies of Messrs. Curtis and Ormsbee, who had lost their lives in the terrible storm, were found, and the returning members of the Tuckerman's Ravine party aided in carrying the bodies to the summit.

On Tuesday the second party over the range set out under Mr. Newcomb's leadership, and a half-day trip was organized for the Alpine Garden and Lion's Head, with Messrs. Lawrence and Endicott as leaders.

Wednesday was stormy at the summit during the morning, so that only the third Club hut party was sent out, this being under the charge of Mr. Whitman. In the afternoon members of the Club to the number of more than fifty strolled down the carriage road three or four miles to below the level of the clouds, and spent the afternoon in sunshine, with delightful views of landscape and fleeting clouds.

Thursday was an ideal day, and several parties took the field. Two official parties were started down the Crawford path, one numbering seven for the Crawford House with Mr. Newcomb, and the second for the summit of Mt. Pleasant and return, fifteen in number, with Mr. Ritchie. Other parties were the following: Boott Spur and Huntington's Ravine, with Mr. Coffin, eight; Oakes Gulf for botanical specimens, with Messrs. Davis and Endicott, five; Lakes of the Clouds, with Mr. Crosby, five; while the photographers seized the occasion and wandered far down the different paths to the most promising view-points. Still another party of Club members, four in number, who had not before been to the summit, made the upward trip of the Crawford path, meeting the different groups scattered along its length, dining with still others in the hotel at noon, and continuing over the range in the afternoon, reaching the Ravine House at night.

Friday was unpleasant, and no trips were taken. On Saturday, July 7, the party left the summit by the early train, most of the members proceeding at once to Boston.

The guides for the week were Vyron D. Lowe and Thaddeus Lowe.

A special feature of the Field Meeting, and a new one, was the daily posting of weather bulletins. Knowing the importance of information about the general weather conditions of the country, the Committee requested these special telegrams, making application through our local Boston official, Mr. Smith. Through the kindness of Acting-Chief H. E. Williams, the important desideratum was furnished each morning to the Committee, and without expense to the Club.

The Field Meeting Committee was: Mr. John Ritchie, Jr., Chairman, Mr. Charles E. Lord, Mr. George D. Newcomb, and Miss Alice N. Patterson.

The plan to purchase Three Mile Island in Lake Winnepesaukee and to erect on it a Club camp gave rise to a number of questions. One of the most vital of these was, Is the island a fit place for such a camp? It was a large enterprise for the Club to undertake without absolute certainty in this respect; so the Committee undertook to answer it by taking a camping party to the spot and making the members of this party give reply to the query. Accordingly THREE MILE ISLAND was accepted rather than chosen for the place of the regular midsummer camp. The result has been one of the most enjoyable camps in the Club history; and a fair test of its success is presented by the fact that about a quarter of the campers wished to remain beyond the time limit stated in the circular, and were disappointed when it was found inconvenient to allow them so to do.

The camping ground was on the southerly end of the island, on land given to the Club by Mrs. Eastman, and nearly all the tents had views across the lake to the south or to the west. The Committee had provided in advance

for the building of a cook-house, towards which a number of individual contributions were given, and for a temporary landing-stage.

The setting-up party of nine, together with Miss Kimball, the cook, and Mr. Brown, the factotum, and the two table waiters, invaded the island rather late on Wednesday afternoon, but in the three days of charming weather that intervened before the coming of the main party there was time to get all the tents pitched and the camp in good running order. The settlement included twenty-four tents, besides the dining tent, which were set up in groups wherever the nature of the soil or the character of the land permitted.

On Saturday, August 5, the main party arrived, coming in the steam launch from Weirs. The table was set that evening for twenty-nine, and another visitor dropped in on Sunday. There was the usual coming and going of small parties, so that on Monday at dinner there were twenty-three, on Saturday a maximum of forty, and the following Monday, thirty-four. The whole number of campers was forty-nine, thirty-one of whom were there for a week or more, eight for less than a week, three overnight merely, while seven dropped in for a single meal. In addition other members of the Club, to the number of six or seven who were located in the neighborhood, visited the camp. The camp broke up on Saturday morning, August 19.

Despite a good proportion of unfavorable weather the campers had a delightful time, with a fairly regular routine of steamer excursions, bathing, boating, and canoeing, with a camp fire on the pleasant evenings. The only mountain trips, however, were to Mt. Belknap and to Red Hill.

The Committee was Mr. Rosewell B. Lawrence, and Mr. John Ritchie, Jr.

Labor Day : August 31–September 4. The annual Labor Day pilgrimage was made to MT. MONADNOCK, this being the first time the Club has established headquarters at the Mountain House. The party numbered forty, and was in charge of Mr. Edwin A. Start. Leaving Boston at five minutes past three P. M., on Friday, August 31, the party arrived at Troy, New Hampshire, at six o'clock. Carriages were in waiting at the station to convey the company to the Monadnock Mountain House, which was reached at about seven o'clock, after a delightful drive. The available accommodations were taxed to the utmost, and it had been found necessary to reject all late applications for places. The Mountain House is somewhat primitive in arrangements and service, but the landlord, Mr. F. S. Schnell, did his best to make the members comfortable, and with reasonable success.

Saturday morning the ascent to the summit was made by most of the party, the main body going with Mr. Start by the beautiful and interesting Ridge path, recently opened by Mr. Smith, of Providence ; and a smaller section, under Mr. Parsons, taking the old and more direct path. The descent was by the latter path. The latter part of the afternoon was enjoyed restfully with an informal meeting in the noble pine grove by the Garnet Spring. Mr. Start made a few remarks upon the unique character of Monadnock and its relation to the neighboring country, and Mr. Edwin D. Mead, who is a native of Cheshire County, gave a most enjoyable talk upon the mountain

and its associations. Sunday, thirty-one enjoyed the twenty-mile drive around the mountain through Troy, Marlboro, Dublin, and Jaffrey. In the evening a meeting was held in the office of the hotel. It was opened by the reading of Emerson's poem "Monadnock," by Mr. Start. This was followed by a rare treat in the form of an hour's reminiscent talk by Dr. Edward W. Emerson, who had come up from his summer home on the mountain side as the guest of the Club. Dr. Emerson developed the personal and æsthetic interest of Monadnock with the familiarity of an almost lifelong acquaintance, with the enthusiasm of a cultivated lover of nature, with the felicitous expression of the man of letters, and the fine insight of the artist.

Monday was the red-letter outdoor day of the trip. Twenty-three spent the day on the mountain. The Ridge path was followed in the morning to a ravine just below the point of junction with the old path. Thence pushing to the right through the brush across the ravine, the crest of the long ridge that overhangs Jaffrey and Dublin was reached and followed to its northern end. Here lunch was eaten, and the return was made to the summit, and down by the path leading by the pinnacle known as Monte Rosa. The most beautiful and interesting features of the mountain's topography were covered during this comfortable day of climbing and rambling over the great ledges. This closed the formal programme. The stated time for departure was Tuesday morning; but only fifteen went at that time, the others drifting homeward at different times, some remaining through the week. The weather was perfect.

Members of the Club were aroused by the disfigurement of the summit for advertising purposes and for various inscriptions. The proximity of Monadnock to many towns and its use as a local resort has led to unusual abuse in this respect. Possible means of preventing this evil were much discussed. Through the agency of members of the party the matter has been brought to the attention of Governor Rollins, and it may be made the subject of legislative attention this winter. The present law, however, goes about as far as legislation can. State ownership and reservation seems to be the only thorough remedy.

Walking Trip, September 6-16. The experiment of a walking trip to cover a period of a week or ten days has been one which the Committee has had in mind for a number of years, but not till last September was the opportunity afforded to test the idea. Walking is by no means a novelty on Club excursions, for at all of them walks of one or two days' duration are undertaken, but these have always returned to the base of supplies. It is quite a different problem to move a party to a new place each day with a new hotel at night. As must be the case with such parties the number was small, fourteen in all, but the peculiar feature of this particular party was the absence of those who are known to be active walkers and who would naturally have been looked for to participate in a trip of the kind.

The party made its start from East Hebron, reaching this place by train to Bristol, a short walk over the exceedingly dusty Bristol roads, and a steamer ride on NEW FOUND LAKE, and after supper the steamer was again brought into requisition for a moonlight sail. This was on Thursday, September 6, and the stopping place for the night was the Hillside Farm

on the borders of the lake. On Friday the day was occupied in strolling along the high and wood roads leading to Plymouth, with resting-places at delightful view-points. The outlook for the morning was towards Cardigan, then towards Moosilauke, taking in the nearer summits of Tenney, Stinson, and Carr, and in the afternoon, when the ridge of Plymouth Mountain had been crossed, the view extended to the Holderness and Franconia mountains. The resting place for the night was the Pemigewasset House in Plymouth. On Saturday the walk was by back roads to Prospect Hill, and thence to Campton Village, where Sunday was spent at the Hillside House. On Monday the walk was resumed up the valley of the Mad River to Waterville, four members making in addition the ascent of Sandwich Dome. Tuesday was rainy, so that consolation was taken in the splendid library at Waterville, with a little tramp in the afternoon to the falls. On Wednesday, in rather dubious weather, the party started on the long woodland trail leading over to North Woodstock, half a dozen making in addition the summit of Osceola. Despite overhanging clouds delightful views were secured from the outlook a few minutes below the summit. In the afternoon the Osceola party made its way to North Woodstock by a path which had recently been swept by a severe storm. Wednesday night was passed at the Deer Park Hotel, and on Thursday the party visited the Lost River, reaching the Flume House in the evening. On Friday the walk was along the summits of the Franconia range, nine hours of steady tramping with the Profile House for a goal, and Saturday the party climbed the col between Cannon and its neighbor in the Kinsman range, a trip which required nine or ten hours of constant effort. Saturday night and Sunday were spent at the Breezy Hill House in Lisbon, and on Monday the party returned to Boston. The distance walked by those who did everything is estimated to have been about equivalent to one hundred and twenty miles in seven walking days, an average of about seventeen miles a day. The leader of the party was Mr. John Ritchie, Jr., and Mr. F. B. Clark was guide.

The novel feature in Club excursions of a special train of Pullman sleepers characterized the beginning of a most successful trip to LAKE MINNEWASKA, N. Y. The company of one hundred and six left the North Station in Boston, on Friday evening, September 21, reaching Albany at seven A. M., the train making connection at the wharf with the day line of steamers on the Hudson River. Breakfast and dinner were served on board the boat, the Albany, and early in the afternoon the transfer was made at Poughkeepsie, first to electric street cars and afterwards to the trains across the bridge. Another change was made to electric cars at Pratt's Mills, and still another at New Paltz to carriages for the ten-mile ride to Minnewaska.

The general programme of the excursion was as follows: Sunday, minor walks in the immediate neighborhood of the hotel; Monday, Beacon Hill, and High, Peterskill, and Awosting paths; Tuesday, a drive to Lake Mohonk, an all-day trip; Wednesday, Awosting Lake and Battlement Terraces, an all-day excursion; Thursday, Millbrook Mountain and Gertrude's Nose, including the Palmaghatt valley; Friday, the Crevices; and Satur-

day, the return to Poughkeepsie, where the party separated, some to go farther afield, some to join the Driving Party, and others still to return to Boston.

The company was an unusually large and an exceedingly pleasant one. In addition to the walks and drives on the regular programme, the members found many other matters to interest and instruct them at Minnewaska. Discussions of the local geology and other features by Mr. Leon S. Griswold and others, and entertainments of lighter character, filled the evenings very pleasantly, while bowling, rowing, and racing in the row-boats served to while away the leisure daylight hours.

An innovation, which was an interesting one, was the "numbered button" device for identifying members of the party. Each participant was furnished with a neat button, which bore a number corresponding to that against his name in the official list, so that the identity of every one was easily determined without the necessity of asking awkward questions. The scheme has its advantages in parties as large as this, and is to the convenience of the regular excursionist as well as the comparative stranger.

The leaders of the party were Messrs. George D. Newcomb and Albion D. Wilde.

The Fall Driving Trip—September 29–October 10—was among the SOUTHERN BERKSHIRES. That of last year began in the same mountain range far north in Vermont, and followed the hills and valleys into Massachusetts at North Adams. The trip of the present year began at the southern end of the mountains and traced them from Connecticut across the State of Massachusetts.

The Driving Party was made up of three groups, some who had been at Minnewaska, others who were direct from Boston, and still others who had journeyed to the place of meeting from Philadelphia, the party numbering twenty-five in all. The rallying point was Mt. Washington, in the southwestern corner of the State, to which the Boston party made its way on Friday, September 28, while the party from Minnewaska arrived on Saturday. The weather was delightful despite the almost continual rains of a few miles to the east, and until the second Monday there was no precipitation. There was, however, a lack of brilliancy in the coloring of the leaves, so that the drive as a whole was not so brilliantly picturesque as that of last year.

The itinerary of the party was this: Saturday and Sunday, Mt. Washington; Monday, October 1, Lakeville, Conn.; Tuesday, Great Barrington and Stockbridge; Wednesday, Lee, Tyringham, Lenox, and Pittsfield; and Thursday, Williamstown, where the first relay of carriages was dismissed. On Friday the party went through the tunnel to Rice's Inn, at the eastern portal, and in the afternoon some enjoyed a drive through Rowe and Zoar, while others walked up Whitecomb Brook. On Saturday the party drove through Florida to Savoy, where dinner was served at Walker's, and in the afternoon proceeded on to Ashfield, passing on the route over a part of the drive of last year. On Monday the drive was to Deerfield and Greenfield, where, according to previous agreement, most of the members went to their homes. Throughout Monday afternoon the rain fell with a vigor strengthened by its long rest, but despite the unfavorable outlook

nine of the party insisted on carrying out the full programme. Accordingly, carriages were taken on Tuesday morning for Warwick, which deposited the party on Wednesday at Orange, on the line of the Fitchburg Division.

In addition to the pleasures afforded by the scenery and the weather, the party received a number of courtesies which added to the enjoyment of the trip. At Tyringham a visit was made to the veteran mineral collector, Mr. Clark, and an hour was spent in viewing his precious specimens. On Sunday Mrs. Hall, of Ashfield, opened her house to the members of the party, and showed her treasures of delicate porcelain, beautiful paintings, including two by Copley and others by Spanish artists, and priceless relics gathered through years of life and travel in foreign countries; on Monday Miss Baker welcomed the party to her home in Deerfield, the oldest house in the town, one which was standing at the time of the massacre, and which has been restored with patient care and unstinted expenditure, and on Monday evening, October 8, Mr. Newton, of Greenfield, invited the Club members to his home, which is filled from cellar to attic with beautiful colonial antiquities. The distance travelled in carriages was about one hundred and seventy-five miles in the nine days of driving. The party was led by Mr. J. Ritchie, Jr.

The Saturday Outings were cared for by a sub-committee, consisting of Messrs. Ritchie, Newcomb, and Wilde. In all, fifty-one were planned, but only forty-six were carried out, the weather interfering with quite a number in the spring. Altogether 1714 persons participated in these Outings, a gratifying increase over previous years, when the comparative smallness of the Harbor Trip is considered.

A detailed list of them follows:—

Date.	Objective Point.	Leader.	Attendance.
Jan. 27.	Melrose Highlands.	Mr. F. V. Fuller.	9
Feb. 3.	Auburndale kame.	Mr. Newcomb.	18
10.	Glacial ridges, Hyde Park.	Mr. Field.	19
17.	Hammond Pond Woods.	Mr. Newcomb.	21
22 (all day).	Bow Ridge Camp and Lynn Beach.	Mr. Newcomb.	10
24.	Arnold Arboretum and Weld Farm.	Mr. Wilde.	28
March 3.	West Quincy, Rattlesnake.	Mr. Ritchie.	26
10.	Quincy, Adams House and President's Hill.	Miss Kincaide. Mr. Norton.	42
17.	Lynn, Prospect Hill, Wild Cat Ledge.	Mr. Newcomb.	21
24.	Devil's Den and Adam's Chair.	Mr. Chamberlain.	47
31.	Cataract at Newton Lower Falls.	Mr. Chamberlain.	27
April 7.	Waverly Oaks and Pierce's Greenhouses.	Mr. F. V. Fuller.	65
14.	Winchester, Horn Pond Mt., and across country to Lexington.	Mr. Newcomb.	43
19 (all day).	Annisquam and Coffin's Beach.	Mr. Newcomb. Mr. Crosby.	120

	21.	Oakland, Bear Hill, and Fells.	Mr. Lynde.	41
	28.	Milton, Buck Hill, and Blueberry Swamp.	Mr. Field.	34
May	5 (<i>all day</i>).	West Quincy, Blue Hill Range.	Mr. J. Ritchie, Jr.	28
	5 (<i>afternoon</i>).	Hancock and Big Blue.	Mr. Newcomb.	40
	12.	Purgatory.	Mr. Witherell.	65
	26.	Lynn Woods, Wolf Pits, and Nell's Pond.	Mr. Bailey.	34
	30 (<i>all day</i>).	West Stoughton and Masapoag Pond.	Misses Endicott.	59
June	2.	Turkey Hill and World's End.	Miss Andrews.	31
	9.	Wellesley Hills, Mt. Pennell.	Mr. Carret.	17
	16 (<i>all day</i>).	Outing in Outer Harbor.	{ Mr. Newcomb. Mr. Crosby.	171
	23.	West Quincy, Rattlesnake.	Miss Kincaide.	19
Sept.	8.	Legg's Hill, Dungeons, and Indian Fort.	Miss Fabens.	22
	15.	Hull, Telegraph Hill, and Pt. Allerton.	Mr. Bailey.	40
	22.	Wakefield, Bear Hill.	{ Miss Shepherd. Miss Gardner.	21
	29.	Wadsworth Hill and Chickatawbut.	Mr. Field.	12
Oct.	6.	Prospect Hill, Waltham.	Mr. F. V. Fuller.	23
	13 (<i>all day</i>).	Blue Hill Outing.	Mr. Ritchie.	16
	13 (<i>afternoon</i>).	Blue Hill Outing.	Mr. Crosby.	28
	13 (<i>two days</i>).	Trolley trip to Mt. Wachusett and Clinton Reservoir.	Mr. Field.	31
	20 (<i>all day</i>).	So. Lancaster, George Hill, and Nashua River.	Miss Wilder.	10
	20.	Weld Brook and Bellevue Hill.	Mr. Howe.	32
Nov.	3.	Moonlight trip to Pegan Hill.	Mr. Newcomb.	36
	6 (<i>all day</i>).	Peabody Boulders to Ship Rock.	Mr. Ritchie.	47
	10.	Westwood, Evergreen Mt., High Rock.	Mr. Moffette.	52
	17.	Norumbega to Riverside.	Mr. Chamberlain.	39
	24.	Lynn Woods, Reservoir.	Mr. Newcomb.	39
Dec.	1.	Adam's Chair and Fiske Hill.	Mr. Chamberlain.	46
	8.	Monatiquot Valley and Ponkapog.	Mr. Field.	77
	11 (<i>all day</i>).	Bartholomew's Pond and Lynn Woods.	Mr. Ritchie.	13
Dec.	15.	Quincy Adams, Penn's Hill, and Pine Hill.	Miss Kincaide.	12
	22.	Roberts, Doublet Hill.	Mr. Chamberlain.	32
	29.	Dedham, Fox Hill, Saddy Valley, and Fairbanks House.	Mr. Field.	31

The number of persons participating in the trips of the year was : —

Snow-shoe trip	75
Chocorua	47
Rutland	57
Mt. Washington	97
Three Mile Island camp	49
Mt. Monadnock	40
Walking party	14
Minnewaska	106
Driving trip	25
	<hr/>
	510
Total on Outings	1714
	<hr/>
	2221

JOHN RITCHIE, JR.,	} Committee on Field Meetings and Excursions.
CHARLES L. BURRILL,	
RALPH C. LARRABEE,	
CHARLES E. LORD,	
GEORGE D. NEWCOMB,	
EDWIN A. START,	
ALBION D. WILDE,	

Proceedings of the Club.

March 14, 1900. — One Hundred and Ninety-ninth Corporate Meeting.

President Perry in the chair.

About two hundred persons were present. The records of the last meeting were read and approved. Sixteen candidates for corporate membership were elected.

Mrs. Mary Dana Hicks explained the movement before the Legislature to have the trailing arbutus, commonly called the mayflower, adopted as the floral emblem of the Commonwealth, and upon her motion it was voted that the Club indorse this movement, and to authorize the President to sign a petition in favor of such legislation.

The Recording Secretary then read a memorial to Congress in favor of establishing a national park at some point in the southern Appalachian region, a memorial prepared by the Council and referred to the Club for action.

After the reading of the memorial it was voted unanimously that it be adopted as the expression of the Club.

Mr. Frederick H. Newell, Hydrographer of the United States Geological Survey, gave a lecture illustrated with the stereopticon, and entitled "From the great forests of the north-

western portion of the State of Washington, and referred to the fires which through carelessness have devastated thousands of acres. A considerable portion of the forested high mountain area has recently been included in a forest reservation. This is being mapped and the character and volume of the timber ascertained. This work is being done by the United States Geological Survey in connection with its systematic examination of the minerals and products of the national domain.

Mr. Newell described briefly the methods of surveying and of travel through the almost untrodden wilderness of forest. In particular he referred to the trails crossing high mountains and to the beautiful scenery of the snow-capped summits. These trails often lead over the snowfields and along glaciers, most of which are unexplored and even unnamed.

On the western side of the high mountains of Washington the climate is humid, the rainfall being as great if not greater than that of any other part of the United States. To the east of the mountains, however, the country is arid, and the rich soil produces crops only when artificially watered. The streams issuing from the glaciers and snowfields flow out into this thirsty land, and their waters taken by ditches are carried to the fields of the farmers, the excess finally making its way into the Columbia River.

In the higher valleys along the mountain range are a number of lakes of glacial origin, some of these being of notable size. One of the most important is Lake Chelan, extending for a distance of ninety miles from the heart of the mountain area out toward Columbia River. This lake is very deep and narrow, the rock walls rising precipitously to the height of several hundred feet. Its waters escape by a narrow gorge to the Columbia. This portion of the Columbia is navigable, small steamers plying on the long pools between the occasional rapids or falls. Its most important tributary below Lake Chelan is Yakima River, in the valley of which large irrigation works have been constructed, making possible the development of a high state of agriculture. Yakima River, like most of the important streams in this part of Washington, heads in the great snowcapped range dominated by Mt. Rainier. This magnificent dome is visible for hundreds of miles in every direction, and offers a most tempting goal to the mountain climber.

Mr. Newell in his lecture gave an account of his trip with the "Mazamas" to the summit of Mt. Rainier, and showed many interesting views of the mountain and of the party ascending the peak.

March 17, 1900. — Special Meeting.

President Perry in the chair.

This meeting was held for the special benefit of the youthful friends of the Club. The audience numbered about three hundred and seventy-five.

Mr. William Lyman Underwood gave an illustrated talk, "Hunting with the Camera," which was in part a repetition of his talk at the Club meeting last June. This time he addressed the children, much to their delight, telling them stories of animals and showing them beautiful pictures of animal life. Many of the views were new, having been taken the past season.

April 11, 1900. — Two Hundredth Corporate Meeting.

Ex-President R. F. Curtis in the chair.

About two hundred and twenty-five persons were present. The records of the meetings in March were read and approved. Nineteen candidates for corporate membership were elected.

Mr. Arthur K. Peck gave his illustrated lecture, "The Grand Canyon of Arizona." He first gave a description of the arid Arizona region, the cliff dwellings, the Moqui Indians, and their snake dance. He then described his trip to the bottom of the canyon and told of Powell's early exploration. A large number of colored lantern views were shown.

April 17, 1900. — Special Meeting.

Ex-President Niles in the chair.

About two hundred persons were present.

Professor E. B. Homer, of the architectural department of the Massachusetts Institute of Technology, addressed the Club, his subject being "A Bicycle Tour through the Riviera and Central France." A small party, consisting of the speaker and several students of architecture, started from Genoa and wheeled along the Mediterranean to Marseilles, and thence up the Rhone Valley, across the mountains, and through Central France to Paris. Many interesting bits of architecture were seen in the little known towns and villages along the route, and much charming scenery, particularly along the Riviera. A large number of lantern views were shown.

May 9, 1900. — Two Hundred and First Corporate Meeting.

President Perry in the chair.

About two hundred persons were present. The records of the meetings in April were read and approved. Fifteen candidates for corporate membership were elected.

Mr. Robert Luce gave his illustrated lecture, "The Maine Woods." A large number of interesting lantern views were shown, many of them colored. Camp life in its various aspects, the lumber industry, hunting and fishing, canoeing on the West Branch of the Penobscot, and the ascent of Ktaadn by the southwest slide were among the features described and illustrated.

May 15, 1900. — Special Meeting.

President Perry in the chair.

On account of the extreme heat and a heavy shower, the audience was unusually small, only about seventy-five persons being present.

Mr. Louis F. Cutter gave an account of "A Journey in Tunis and Algeria." After a few words about Gibraltar and Genoa, and an instructive description of the history, geography, and climate of northern Africa, the speaker in narrative form told of his trip, illustrating with a large number of lantern views from negatives taken by himself. The customs of the people, the architecture of mosques and dwellings, and the scenery of mountains and ravines were especially interesting.

June 13, 1900. — Two Hundred and Second Corporate Meeting.

President Perry in the chair.

One hundred and sixty-five persons were present.

The records of the last regular meeting were read and approved. Mr. William Williams, of New York, was elected a Corresponding Member. Twenty-seven candidates for corporate membership were elected.

Mr. Alexander Hamilton Rice gave an account of his trip to Spitzbergen, Norway, Russia, and the Caucasus. With a map of Spitzbergen, he pointed out his route in a little walrus steamer among the islands, the party being in search of large game. Some deer and walrus were found, but no bears. The features of the country, mountains, and glaciers were described. Returning to Norway he travelled across Scandinavia, visited St. Petersburg, Moscow, and Nijni Novgorod, and then made a trip into the mountains of the Caucasus. A large number of interesting lantern views were shown, made from photographs taken by the speaker, many of them under unfavorable conditions.

June 30 to July 7, 1900. — Thirty-fifth Field Meeting, held at the Summit House, Mt. Washington, N. H.

President Perry in the chair.

Three meetings were held in the hotel parlor.

On Saturday evening, June 30, the day of the arrival, the President called together a meeting of about seventy members and friends, and after referring to the terrible storm then prevailing, introduced the chairman of the committee in charge of the excursion, Mr. J. Ritchie, Jr., who announced the plans for the Field Meeting, concluding with remarks, explanatory and cautionary, about the trips.

On Wednesday evening, July 4, there was an attendance of eighty-two. In opening the meeting the President referred, among other features, to the opportunity for study, and then introduced, as the speaker of the evening, Professor C. H. Hitchcock, of Hanover, who took as his subject, "The Geology of Mount Washington." After alluding to his father's observations on glaciation, the speaker gave an account of his own researches and conclusions. Foreign stones and striae have been found on the top, proving that the Labrador ice-sheet passed over the summit in a southeasterly direction. He recommended to members a study of the boulders and markings, the different kinds of rock, and the shape of the ledges. In comparison he referred to his observations among the Green and Adirondack Mountains, and upon Mauna Loa in the Hawaiian Islands.

On Thursday evening the attendance was about seventy-five. Mr. R. B. Lawrence spoke of the project to build a camp on Three Mile Island in Lake Winnepesaukee, and exhibited a sketch of same.

President Perry, in well chosen words, then addressed the Club on the unfortunate occurrence of the preceding Saturday, which resulted in the loss of two lives, Mr. W. B. Curtis, a Club member, and his friend Mr. Allan Ormsbee, who were on their way to the summit of Mt. Washington to attend this Field Meeting.

On motion of Mr. J. Ritchie, Jr., the Corresponding Secretary, the following brief memorial was passed unanimously :—

The members of the Appalachian Mountain Club regret and deplore the death of Mr. W. B. Curtis and Mr. Allan Ormsbee, one of whom was a member of the Club, and desire to convey to the relatives of these men the expression of their sincere sympathy.

In recognition of the assistance generously given the Club in connection with this sad event, the following resolution was passed :—

The members of the Appalachian Mountain Club desire hereby to express their appreciation and gratitude to Mr. John Horne, Superintendent of the Mt. Washington Railroad, to Mr. Oscar G. Barron of the Fabyan House, and to the employees of the railroad and the Summit House, for their noble generosity and splendid assistance in connection with the recent accidents on Mt. Washington.

President Perry then advocated earnestly the erection of a shelter near the base of the cone, which would serve as a refuge in severe weather. [The Council has since appointed the President and the Councillor of Improvements a Committee on the subject, with full power to solicit contributions and erect such a shelter.]

Mr. J. Rayner Edmands spoke of Mr. Curtis's qualifications as an athlete and his genial disposition, and then moved —

That the President of the Club and the Chairman of the Committee for this meeting — Messrs. Perry and Ritchie — be a committee officially appointed by this meeting of the Club, to collect the information, to get minutes of such first-hand reports as they can, and to take some way to let the public have one connected account, with such brief conclusions as they may feel warranted in drawing from what they have to present. (See p. 323.)

An amendment was offered that Mr. Edmands be added to the Committee, and the amendment and the motion as amended were passed.

September 19, 1900. — Special Meeting.

Professor Charles E. Fay in the chair.

Three hundred and fifty persons were present.

Mrs. Fanny Bullock Workman gave a lecture, illustrated by lantern, on her Biao trip and her three pioneer ascents in Baltistan. Mrs. Bullock Workman, a daughter of ex-Governor Bullock, of Massachusetts, has achieved the distinction of climbing higher than any other woman, her highest peak being Koser Gunge, in northern Kashmir, about 21,000 feet. The Siegfriedhorn and Mt. Bullock Workman were also climbed. The party included her husband, Dr. Workman, who also addressed the meeting briefly, and the Swiss guide Zurbriggen. A large number of coolies were employed. The views taken by the party and thrown upon the screen were exceedingly grand, and the lecturer's narrative intensely interesting. (See p. 237.)

October 10, 1900. — Two Hundred and Third Corporate Meeting.

President Perry in the chair.

About one hundred and twenty persons were present. The records of the regular meeting in June, the field meeting in July, and the special meeting in September were read and approved. Twenty-seven candidates for corporate membership were elected.

The President appointed the following Committee to nominate officers for 1901: John Herbert, Chairman, Mrs. Parker B. Field, George H. Barton, Miss Ella M. Rice, and Winthrop Coffin.

Mr. R. B. Lawrence explained the project to purchase Three Mile Island in Lake Winnepesaukee and build a camp thereon. Miss Helen E. Endicott then gave an account of the summer camping party on the island, the trips about the lake, and the ascents of Belknap and Red Hill. The canoeing and bathing, and other interesting features of camp life were described. Miss Charlotte M. Endicott read a paper on the flora of the island. Forty-nine lantern views were shown, illustrating the island, the summer camping party, and the proposed building.

On motion of Professor C. E. Fay it was voted to request the Council to consider the advisability of tendering a reception to Edward Whymper, or inviting him to address a meeting of the Club. [On October 22 Mr. Whymper accepted an invitation to meet the present and past officers of the Club at the Club-rooms.]

November 14, 1900. — Two Hundred and Fourth Corporate Meeting.

President Perry in the chair.

One hundred and thirty-five persons were present. The records of the last meeting were read and approved. Thirty-one candidates for corporate membership were elected.

Action was taken upon the following amendments to the By-Laws : —

Amend Art. XIX. by changing "Exploration" to "Improvements," so that the first part of the Article shall read : —

ART. XIX. The real estate belonging to the Club shall be under the control and direction of a Board of Trustees, consisting of the Councillor of Improvements for the time being, and four members of the Club, who shall be chosen by ballot, etc.

Amend Art. X. by inserting after "Exploration" the words "and Forestry," so that the first paragraph of the Article shall read : —

ART. X. The five Councillors shall be chosen to represent, severally, the departments of Natural History, Topography, Art, Exploration and Forestry, and Improvements.

The first amendment was lost and the second carried, both votes being unanimous.

Mr. J. Ritchie, Jr., gave an account of the trip of the September walking party in the valley of the Pemigewasset. Though a new feature in Club excursions, it proved very satisfactory.

Professor W. H. Niles spoke concerning the moraine on the Joseph Story Fay Reservation, at North Woodstock, N. H. After a short introduction

concerning glaciers and moraines, he gave his observations at North Woodstock, showing the remains of an old terminal moraine of large size on the Club land, the centre of which has been worn away, the other horn of the crescent being found on the east side of the river.

December 12, 1900. — Two Hundred and Fifth Corporate Meeting.

President Perry in the chair.

One hundred and twenty-five persons were present. The records of the last meeting were read and approved. Sixteen candidates for corporate membership were elected.

The President appointed as Auditors, Messrs. Louis F. Cutter, J. E. Alden, and F. V. Fuller; and as the Committee on the Annual Reception, Mr. Albert S. Parsons, Mrs. James R. Carret, Mr. Harlan P. Kelsey, Miss Helen E. Endicott, and Mr. Walter L. Chaloner.

The following amendment to the By-Laws at its second reading was unanimously adopted:—

Amend Art. X. by inserting after "Exploration" the words "and Forestry," so that the first paragraph of the Article shall read:—

ART. X. The five Councillors shall be chosen to represent, severally, the departments of Natural History, Topography, Art, Exploration and Forestry, and Improvements.

It was voted to ratify the action of the Council in appropriating to the Permanent Fund the bequest of Mrs. Thorndike, one thousand dollars, the same to be called "the Delia D. Thorndike Fund."

The reports of the Councillors of Topography, Art, and Improvements were presented, showing the work accomplished in the various departments during the past year. Voted to receive and adopt the reports.

Dr. H. W. Tyler gave an interesting account of his trip last June over the Twin Mountain Range and through the wilderness of the East Branch. He also included his trip over the Carter-Moriah path. (See p. 302.)

December 19, 1900. — Special Meeting.

President Perry in the chair.

About three hundred persons were present.

Mr. A. J. George, instructor of English in the Newton High School, gave an illustrated lecture entitled, "Rambling with Wordsworth, or Life and Nature in the English Lakes." The English lake region is not only rich in Wordsworth associations, but renowned for its beautiful scenery. The lecturer, being a close student of the poet and familiar with these lakes and mountains, was very successful in leading his audience in their rambles. A large number of lantern views were shown.

January 9, 1901. — Two Hundred and Sixth Corporate (Annual) Meeting.

President Perry in the chair.

This was the first meeting in the new century, and the beginning of the second quarter-century in the Club's history, the first preliminary meeting

having been held at the Massachusetts Institute of Technology, January 8, 1876. There were one hundred and seventy-five persons present, including ex-Presidents Fay, Edmands, Mann, Curtis, Parsons, Shepard, and Herbert.

The records of the meetings in December were read and approved. Fifteen candidates for corporate membership were elected.

Mr. J. Ritchie, Jr., presented the report of the Excursion Committee, and Professor C. E. Fay the report of the Committee on the Sella Collection.

The annual reports of the Treasurer, Trustees of the Permanent and Reserve Funds, Auditors, Trustees of Real Estate, Corresponding Secretary, Room Committee, and Recording Secretary were presented.

Ex-President John Herbert, Chairman of the Committee to nominate officers for the year 1901, reported as follows : —

For President, Alexis H. French ; for Vice-President, Edward W. Howe ; for Recording Secretary, Rosewell B. Lawrence ; for Corresponding Secretary, John Ritchie, Jr. ; for Treasurer, Rufus A. Bullock ; for Councillor of Natural History, Harlan P. Kelsey ; for Councillor of Topography, Frederic Endicott ; for Councillor of Art, Mrs. Lewis B. Tarlton ; for Councillor of Exploration and Forestry, Allen Chamberlain ; for Councillor of Improvements, Louis F. Cutter ; for Trustee of the Permanent and Reserve Funds (for three years), Rest F. Curtis ; for Trustee of Real Estate (for four years), J. Rayner Edmands.

The balloting resulted in the election of the candidates nominated.

The retiring President, Mr. Perry, expressed his regret at relinquishing the chair, and reminded the Club that he had been privileged to preside during two centuries. He expressed confidence that the gentleman selected to succeed him, who has so successfully engineered the beautiful suburb of Brookline, would draw the lines of the Club in pleasant places. He then appointed Ex-President Fay a Committee to escort the President-elect to the chair. Mr. Fay accepted this duty with great satisfaction, he having been the chairman at the first preliminary meeting of the Club held January 8, 1876, a quarter of a century before. President French expressed to the Club his appreciation of the honor conferred upon him and his great interest in the Club.

Ex-President Edmands, in behalf of the Committee appointed at the Field Meeting, presented the report on the fatalities on Mt. Washington during the storm of June 30, 1900. (See p. 323.) Lantern views were shown illustrating the Crawford bridle-path, the cone of Washington, the rough rocks and beautiful frostwork, the monuments erected, and the portraits of the unfortunate men.

January 16, 23, and 30, 1901. — Special Meetings.

At these three meetings stereopticon lectures were given by Mr. Rosewell B. Lawrence, with the approval of the Council, for the purpose of raising a fund to furnish the camp at Three Mile Island, Lake Winnepesaukee, and to provide for a float, boats, and other necessities. The tickets, one dollar for the course, were placed on sale at the Club rooms, and the net proceeds amounted to \$205. The attendance was about two hundred and twenty-

five. Vice-President Howe introduced the speaker at the first and second meetings, and President French at the third.

The first lecture, "The Yellowstone Park," described a thirty days' trip on horseback through the National Park, visiting the grand canyon, geyser basins and the lake region, and climbing Mts. Washburn and Sheridan, and Electric Peak. A hundred stereopticon views illustrated the grand, strange, and beautiful scenery of America's Wonderland. With camp outfit and horses, it was possible to visit many points of interest unknown to the ordinary tourist.

The second, "The Carolina Mountains," spoke of that charming section of our country which possesses the highest mountains east of the Mississippi, beautiful rivers, great mineral wealth, magnificent forests, and a mild yet invigorating climate, — a land famous for the coloring of its heavens and its flowers, "The Land of the Sky."

The third, "The Maine Woods," showed the scenery of the Rangeley Lake region, the Penobscot waters, and Ktaadn, the highest mountain in Maine. Camp life in tent and log cabin, canoeing on the lakes and rivers, the great lumber industry, trout, moose, etc., were pictured upon the screen.

February 13, 1901. — Two Hundred and Seventh Corporate Meeting.

President French in the chair.

The records of the meetings in January were read and approved. About one hundred and seventy-five persons were present. Fifteen candidates for corporate membership were elected.

A paper prepared by Mr. J. Henry Scattergood, of Philadelphia, "The Beaverfoot Valley and an Ascent of Mount Mollison, Canadian Rockies," was read by Professor C. E. Fay. A large number of lantern slides were shown, and several interesting topographical problems were presented and discussed by the reader.

The President showed four slides showing views on the Crawford bridle-path and including one of a small tent in which several persons took refuge in a storm. Mr. Turner described the storm and the experiences of the party, and expressed an interest in the Club's proposed shelter at the base of the cone of Washington.

Mr. R. B. Lawrence showed the lantern views of Three Mile Island and camp, which were shown last October, and several new views of the permanent camp erected in November.

March 13, 1901. — Two Hundred and Eighth Corporate Meeting.

President French in the chair.

The records of the last meeting were read and approved. About two hundred and seventy-five persons were present. Twenty-four candidates for corporate membership were elected.

An illustrated lecture, entitled "Picturesque New Zealand," was given by Mr. Sidney Dickinson, F. R. G. S. This lecture was prepared under direct commission of the New Zealand Government and was delivered throughout Australia. The hot springs, geysers and volcanic eruptions, the lakes and fjords, glaciers and mountains were described and illustrated.

Officers for 1901.*President.*

ALEXIS H. FRENCH, Town Hall, Brookline.

Vice-President.

EDWARD W. HOWE, 65 City Hall, Boston.

Recording Secretary.

ROSEWELL B. LAWRENCE, Tremont Building, Room 745, Boston.

Corresponding Secretary.

JOHN RITCHIE, JR., P. O. Box 2795, Boston.

Treasurer.

RUFUS A. BULLOCK, Tremont Building, Room 1049, Boston.

*Councillors.**Natural History*, HARLAN P. KELSEY, Boston.*Topography*, FREDERIC ENDICOTT, Canton.*Art*, L. LOUISE TARLTON, Watertown.*Exploration and Forestry*, ALLEN CHAMBERLAIN, Winchester.*Improvements*, LOUIS F. CUTTER, Winchester.*Trustees of Permanent and Reserve Funds.*

REST F. CURTIS. ISAAC Y. CHUBBUCK. CHARLES H. FRENCH.

Trustees of Real Estate.

HARVEY N. SHEPARD.

CHARLES E. FAY.

J. RAYNER EDMANDS.

AUGUSTUS E. SCOTT.

ALLEN CHAMBERLAIN, *Ex-officio*.

Members added since January, 1900.

- Allen, Glover M., Cambridge.
 Atkinson, Mrs. Josephine R., Boston.
 Barney, Ernest A., Canaan, N. H.
 Bartlett, Mrs. L. Florence, Roxbury.
 Bartlett, Miss Margaret A., East Boston.
 Bates, Miss Edith F., Wollaston.
 Bell-Smith, F. M., Toronto, Canada.
 Bigelow, Charles, Hinsdale, N. H.
 Blackmar, Miss Gertrude, Newton Centre.
 BLIZARD, MRS. JAMES H., Lynn.
 Bock, Miss Sarah M., Dorchester.
 Bonelli, Joseph M., Boston.
 Breck, Miss Mary A., Milton.
 Breed, Miss Emma H., Lynn.
 Brewer, D. Chauncey, Boston.
 Brittin, Louis H., Ansonia, Conn.
 Brown, Miss A. V. V., Wellesley.
 Brown, Miss Lucy H., Roxbury.
 Bryant, Henry F., Brookline.
 Bryant, Mrs. Jennie S., Brookline.
 BUNKER, GEORGE W., Concord, N. H.
 Burdett, Miss Helen E., Dedham.
 Burgess, Miss Ella T., Boston.
 Butler, Alfred M., Philadelphia, Pa.
 Carpenter, Allen F., Somerville.
 Carpenter, Miss Lena L., Boston.
 Chace, Miss Anna H., Valley Falls, R. I.
 Clark, Miss Josephine A., Washington, D. C.
 Cochrane, Miss Catherine D., Cambridge.
 Cochrane, Mrs. Lucy L., Cambridge.
 Cole, Mrs. Emeline T., Roxbury.
 Coombs, Zelotes W., Worcester.
 Cotter, Miss Elizabeth A., Lynn.
 DAVIS, GEORGE P., Hartford, Conn.
 Dodge, Miss Sarah R., Charlestown.
 Dow, Miss Ada H., Bangor, Me.
 Downes, Philip H., Brookline.
 Dowse, Charles F., Boston.
 Draper, Mrs. Charles E., Roxbury.
 Duffill, Albert E., Boston.
 Dyer, Miss Ida M., Boston.
 Earle, Miss Mabel L., Lynn.
 Edwards, John H., Boston.
 Edwards, Mrs. Levi F., Boston.
 Ellis, Mrs. Ellen A., North Cambridge.
 Field, Whitcomb, Milton.
 Fiske, Mrs. Sarah D., Malden.
 Flagg, Charles S., Boston.
 Flagg, George A., Malden.
 Foster, Mrs. Lora M., North Cambridge.
 Fowler, Albert E., Boston.
 Francis, Mrs. Corabelle G., Boston.
 Frazar, Mrs. Mae D., Boston.
 Fuller, Miss M. A. H., Roxbury.
 Furbish, Mrs. Sarah H., Lynn.
 Galpin, Mrs. Barbara, Somerville.
 Gay, Joseph B., Newton Centre.
 Giles, Mrs. Lucy A., Melrose.
 Gill, Frederic, Arlington.
 Gow, John R., Somerville.
 Griswold, Miss Kate D., Boston.
 Griswold, Loren E., Boston.
 Gustin, Miss Violetta, Dorchester.
 Hadaway, Mrs. Helen A., Malden.
 Hadley, S. Henry, Somerville.
 Hall, Mrs. Alice C., Cambridge.
 Haworth, John H., Lowell.
 Heal, Winslow H., Lynn.
 Heal, Mrs. Winslow H., Lynn.
 Hoag, Louis, Boston.
 Hodgman, Miss Harriet M., Boston.
 Hooper, Miss Martha N., Washington, D. C.
 Hosmer, John G., Boston.
 Hyde, George E., Boston.
 Ilgen, Fred. D., Brooklyn, N. Y.
 JENKS, HENRY ANGLIER, Canton.
 Johnson, Miss Mary L., Jamaica Plain.
 Jones, Leonard A., Boston.
 Judson, Charles F., Philadelphia, Pa.
 Kelly, Miss C. H., Brookline.
 Lang, Thomas, Jr., Malden.
 Leavitt, Frederick A., Brookline.

- Lynes, Mrs. Frank, North Cambridge.
 McInnes, F. A., Dorchester.
 Marcle, Walter J., Rutland.
 Marsh, Miss Nina M., Cambridgeport.
 Maxwell, Miss Lucy H., Boston.
 MEAD, GEO. N. P., Winchester.
 MEAD, MRS. GEO. N. P., Winchester.
 Merrill, Miss A. Marion, Somerville.
 Moffette, Edward, Dedham.
 Moffette, Mrs. Edward, Dedham.
 Morgan, J. C., Lynn.
 Morrison, Wm. F., Providence, R. I.
 Noyes, George E., Lynn.
 Newhall, Miss Lilla M., Wakefield.
 Osgood, Miss Mary P., Salem.
 Parsons, Mrs. Estelle H., Dorchester.
 Parsons, Miss Mary N., Derry, N. H.
 Patten, Miss Mary E., Watertown.
 Pickard, Greenleaf W., Boston.
 Plummer, Edward M., Charlestown.
 Pope, George W., Newtonville.
 Pritchett, Henry S., Boston.
 Rawles, James D., Boston.
 Rawles, Mrs. James D., Boston.
 RICE, ALEXANDER H., Boston.
 Rogers, Thomas E., Washington, D. C.
 Rogerson, Chas. E., Boston.
 Rugg, Arthur P., Worcester.
 Russell, James S., Boston.
 Sanborn, Elmer E., Lynn.
 Scattergood, J. Henry, Philadelphia, Pa.
 Schirmer, Frank A., Boston.
 Seaver, Charles M., West Roxbury.
 Seaver, Miss M. Kate, Roxbury.
 Sever, Miss Martha, Cambridge.
 Shapleigh, Mrs. E. Edeah, Boston.
 Shapleigh, Mrs. T. W., Boston.
 Shearer, Augustus H., Cambridge.
 Sherrard, Miss Evelyn B., Wellesley.
 Short, Miss Fanny L., Dorchester.
 Smith, A. Otis, West Somerville.
 Spinney, Miss Abby M., Reading.
 Spinney, Miss Helen A., Reading.
 Spinney, William F., Reading.
 Starratt, A. Wilbert, Boston.
 Stiles, Chester F., Cambridge.
 Stone, Arthur P., Boston.
 Stone, Mrs. Arthur P., North Cambridge.
 Stow, James P., Middletown, Conn.
 Stratton, Miss Annie F., Cambridge.
 Sweeney, Peter M., Lawrence.
 Teele, Woodman H. W., North Cambridge.
 Tewksbury, J. H., Brookline.
 Thomasson, Aaron H., Boston.
 Thompson, S. H., Lowell.
 Tyler, Miss Emily W., Newton Centre.
 Tyrrell, H. G., Newton.
 Tyrrell, Mrs. H. G., Newton.
 Upham, Miss Mary E., Melrose.
 Usher, Samuel, North Cambridge.
 Waldo, Frank, Cambridge.
 Washburn, Henry B., Worcester.
 Weeden, Miss Sarah G., Charlestown.
 Wells, Harry M., Reading.
 Williston, Miss Constance B., Cambridge.
 Wight, Mrs. Freeman C., Boston.
 WITHERINGTON, HENRY A., Boston.
 WRIGHT, GEORGE S., Watertown.

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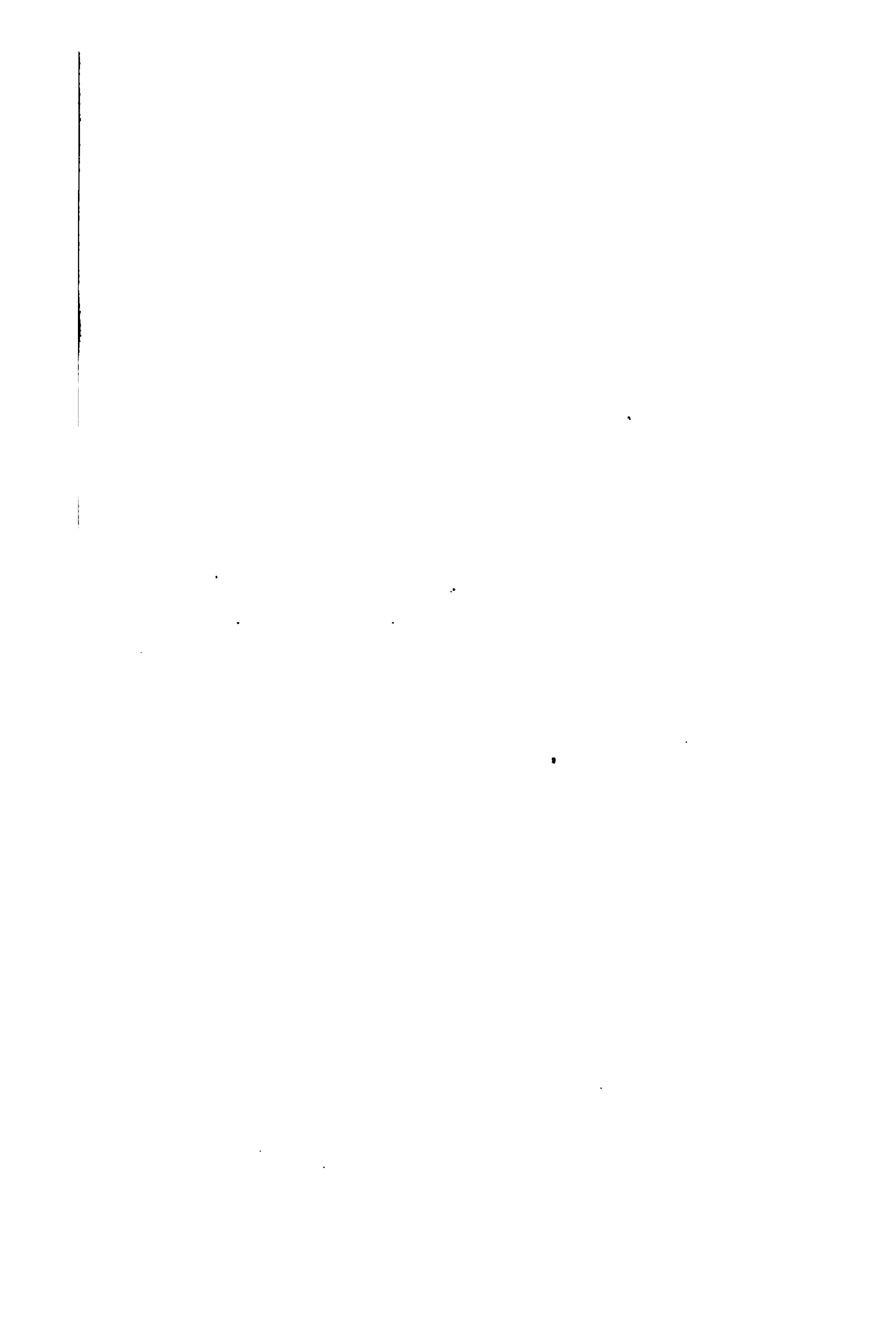
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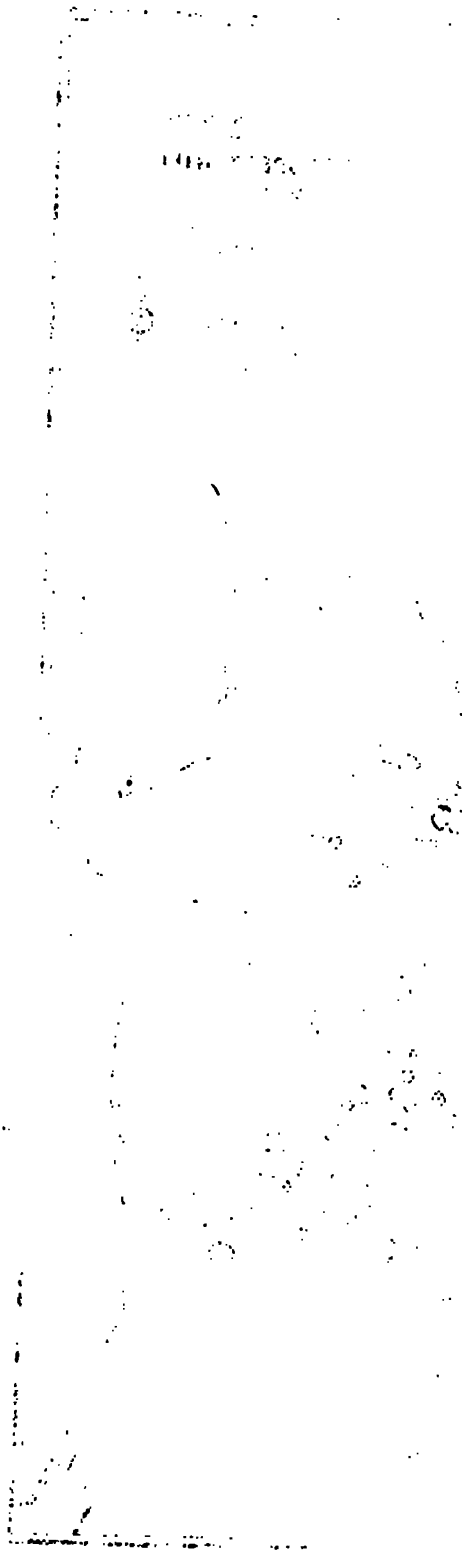
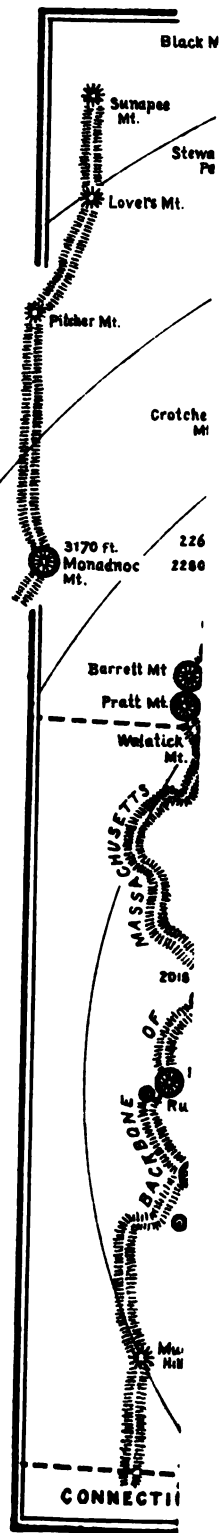
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THIS MAP APPLIES ALMOST EQUALLY WELL TO THE PROFILE FROM RAM'S HEAD HILL



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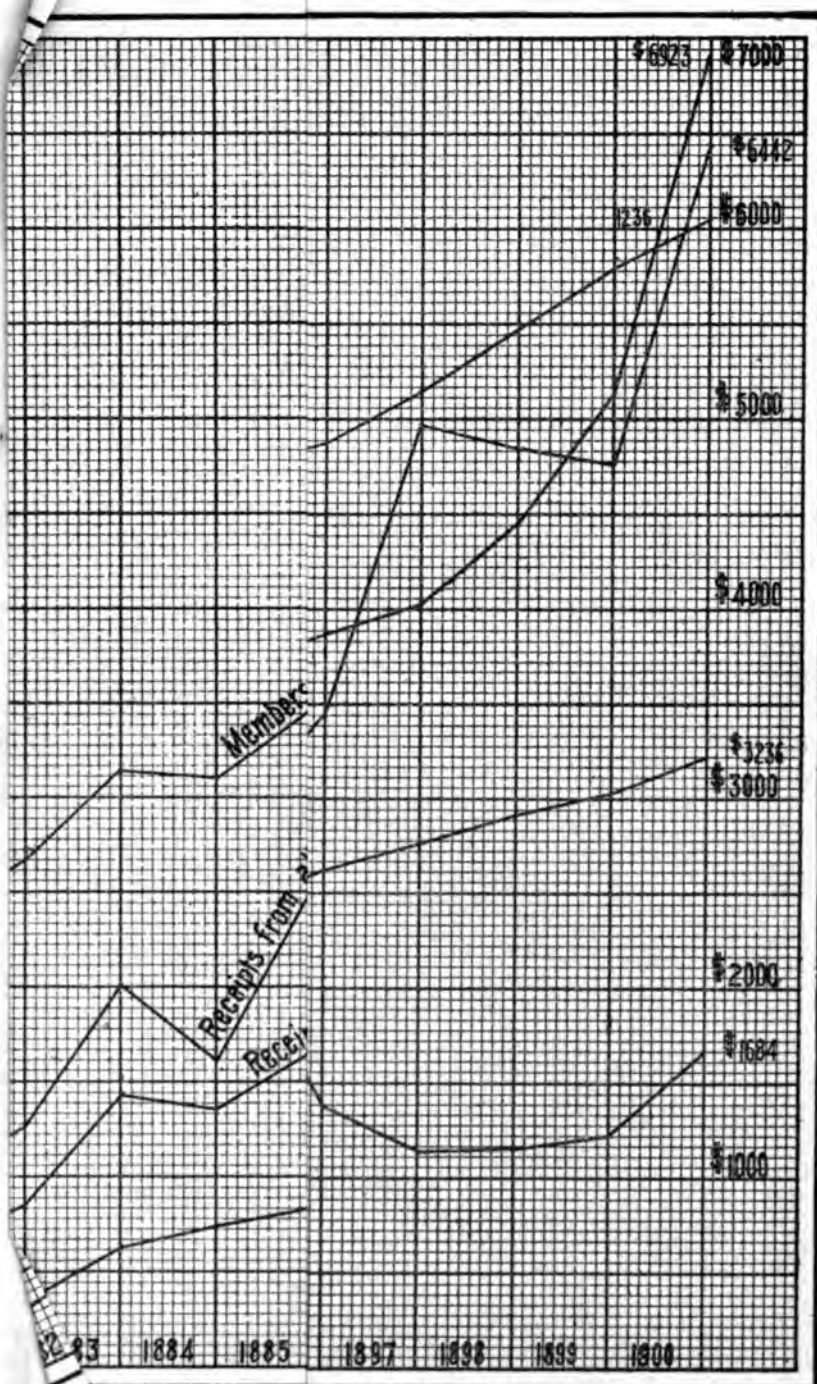
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APPALACHIA VOL. IX.	Little River Lumber	Forks of the	Vol. III. 2, p. 107.	1 twin 4 m, bond 11 m, forks 10 m.	PLATE XXIX.
Franconia	R. R., below Camp 3.	Pemigewasset River.	Vol. IX. 4, p. 380.	Very little water.	
Region				From S. Twin, blazed trail only.	

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